AUGUST 1955

AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING
SHEET METAL CONTRACTING

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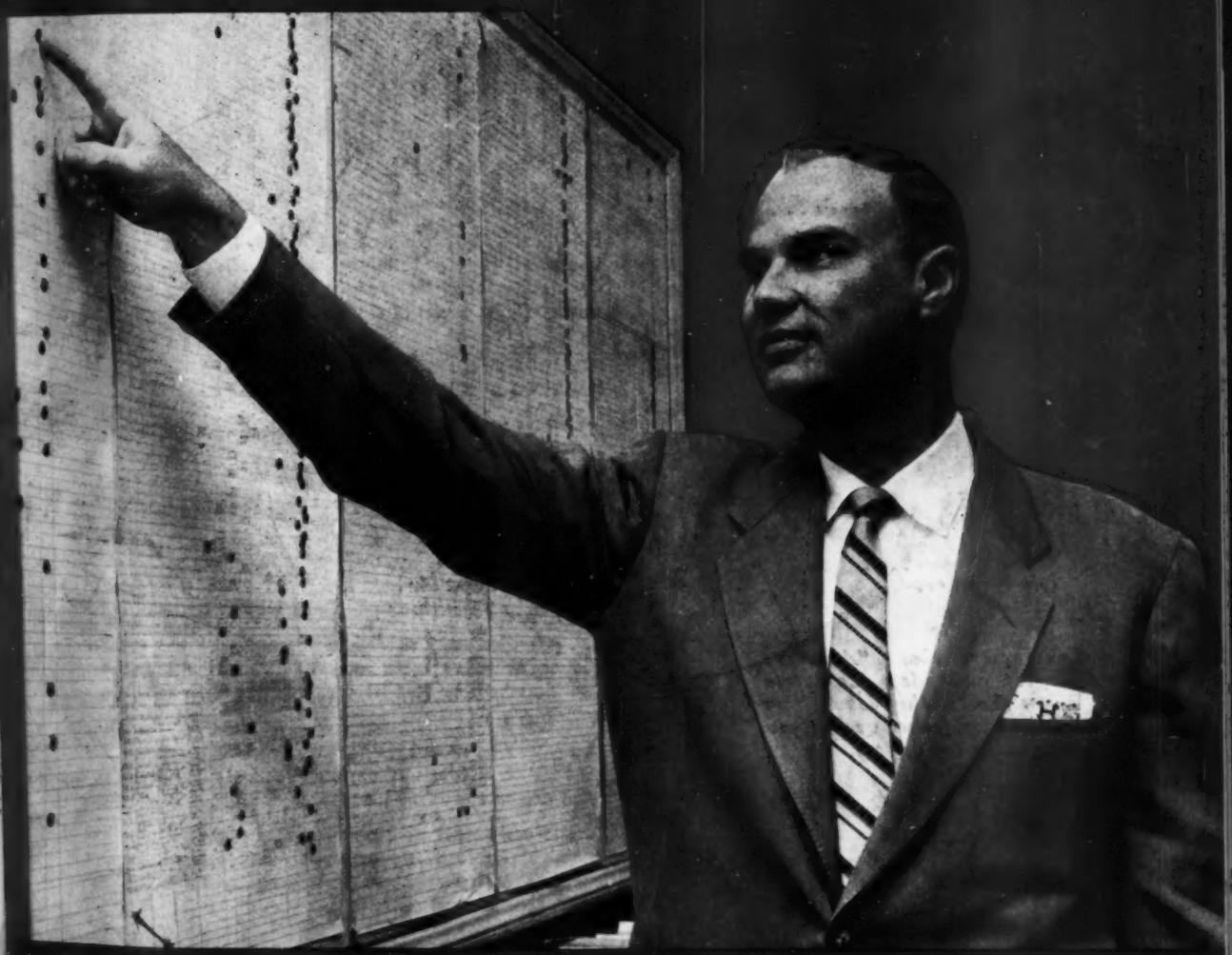
AUG 17 1955



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IN SUBURBAN SHOPPING CENTERS . . . the trend is to

JACKSON & CHURCH FURNACES

Suspension furnace . . . 80,000 to 1,000,000 btu output.

Powerated furnace . . . 380,000 to 4,700,000 btu output.

Learn more about "America's Largest and Most Complete Warm Air Heating Line" from the stocking jobber nearest you or write to our factory.

New York, Pennsylvania, Illinois, Michigan . . . in these states and many more, shopping center architects, contractors and owners have selected versatile Jackson & Church warm air furnaces.

BECAUSE THEY'VE FOUND AN INDIVIDUAL CENTRAL HEATING SYSTEM WITH J-C FURNACES:

. . . provides an even distribution of air throughout the shopping area with inconspicuous ducts to take the heat where it is needed. Chilly floors, common with other types of heating, are unknown.

. . . eliminates noisy, unsightly heating units overhead that blast air into the faces of customers and heat only the upper portions of the room.

. . . permits easy addition of cooling units—either during or after installation of the furnace—since ducts and other facilities are basic with warm air systems.

. . . gives as many as seven air changes per hour by blending fresh air with room air (impractical with other types of heating).

. . . is automatically controlled to guard against uncomfortable temperatures during peak traffic loads. Store customers and employees are kept comfortable and satisfied.

J-C

JACKSON & CHURCH CO. SAGINAW, MICHIGAN

Work well done since eighty-one

"PACKAGED" FANS

Clarage V-belt Ready Units answer economically your smaller air handling requirements

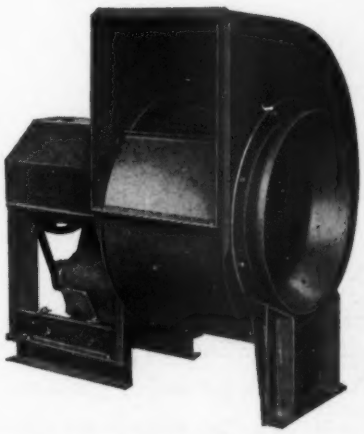
complete Ready to run, with fan, motor, and drive in one compact, easily installed assembly. 18 sizes, wheel diameters 9¾ to 32½", capacities to 12,000 cfm. Direct connected units also available.

adaptable Quickly adjustable in the field for various directions of air discharge. Slow speed, forward curved blade wheels or medium speed, backwardly inclined blade wheels available. Special units for handling corrosive gases and other special assignments can be provided.

rugged Typical Clarage heavy-duty construction throughout. All working parts readily accessible, yet entire drive (except on largest sizes) is within frame of unit — an important distinguishing feature!

quiet When properly selected and applied, Clarage Ready Units meet the most exacting requirements in respect to quietness of operation.

capable Within their performance range, these units are unsurpassed for maximum air delivery at low power cost. You can select them with confidence for ventilation, exhausting, and other low pressure applications.



View of a standard Ready Unit as built in the medium-size range. Note how operating parts are shielded.

Ready Unit equipped with drive guard (at the end) and outdoor covers (on the sides) which provide complete weather protection.

For 28 pages of complete information on Clarage Ready Units, request Catalog 515.

CLARAGE FAN CO., Kalamazoo, Mich.

You can Rely on **CLARAGE** ... *dependable equipment for making air your servant*

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreal

AMERICAN ARTISAN

AUGUST 1955

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Founded 1864

Volume 92 No. 8

WARM AIR HEATING
RESIDENTIAL AIR CONDITIONING
SHEET METAL CONTRACTING

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"

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Published monthly by Keeney Publishing Company, 6 N. Michigan Ave., Chicago 2, Ill., U.S.A.

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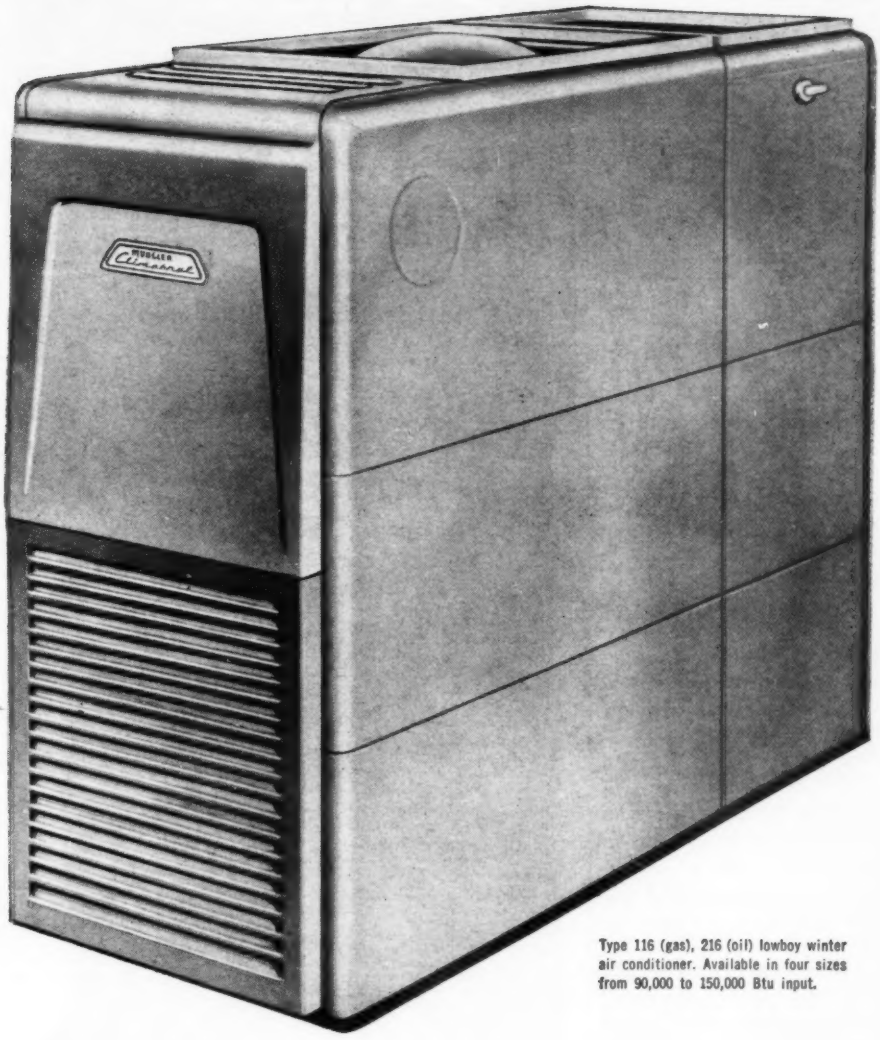
Member of Audit Bureau of Circulations, Magazine Publishers Association, Inc., and Associated Business Publications

Yearly Subscription Price—U.S. and possessions, $3.00; Canada, Cuba, Mexico, South America, Central America, $4.00; Others $6.00. Single copies, U.S. and possessions, 35c. Back numbers, 60c. January, 1955, Directory Issue, $1.50 per copy. *Change in Address*: Report new and old address to publisher and local post office; deadline date 18th of preceding month. Entered as second-class matter, July 29, 1932, at the post office at Chicago, Illinois, under the Act of March 3, 1879. Additional entry at Mendota, Ill.

Quality built...



Type 116 (gas), 216 (oil) lowboy winter air conditioner. Available in four sizes from 90,000 to 150,000 Btu input.

Mueller Climatrol

Quality best describes Mueller Climatrol — best describes Mueller Climatrol design, materials, and workmanship. Behind Mueller Climatrol quality are advanced engineering and modern manufacturing methods — methods that permit precision production and insure precision performance of the finished product. Behind Mueller Climatrol quality, too, is continuous inspection of each unit.

Because Mueller Climatrol never compromises on quality, you get strong talking points that give you the edge in competitive selling. Put Mueller Climatrol advantages to work for you. Write us: Mueller Climatrol, Dept. 185, 2030 W. Oklahoma Avenue, Milwaukee 15, Wisconsin.

The Most Complete Line

A Deluxe Line for custom homes, modernization jobs: highboys, lowboys, companion units.

The Suburbanaire Line for competitive jobs, housing projects: gravity, counterflows, horizontal, highboys, lowboys.

A Commercial Line of unit heaters, boilers and packaged air conditioners in a wide range of sizes.

A Conversion Line of add-on cooling, conversion burners, incinerators, blower-filter units, a recessed summer conditioner.

A Cooling Line second to none. Air-cooled and water-cooled in wide range of sizes — deluxe units, packaged units, add-on units, self-contained and remote units.

98th Anniversary

NEARLY 100 YEARS OF MANUFACTURING QUALITY COMFORT EQUIPMENT

the editor's notebook

Thumbing Through This Month's Artisan

. . . we take a trip to Houston to determine *Who Buys — and Who Sells — Residential Air Conditioning?* Surveying the "world's most air conditioned city" in order to establish a pattern for other parts of the country, Artisan's report to the industry reveals that the trend is toward air conditioning in lower priced homes, that the average installation size becomes smaller as air conditioning goes into smaller homes and that both the new home and the existing home represent important air conditioning markets. We also observe the influence on central installations of the sales of window units (which often lead to sales of central units) and we note the various problems encountered by the local utilities. We find the dealers who do the big proportion of central home air conditioning to be warm air men who do their own sheet metal, pipefitting and plumbing work on air conditioning installations.

Management . . .

AND WE sit in on planning sessions which are the basis of success for a heating-air conditioning business where *Sales Minded Management Leads the Way* to more sales through constant analysis of sales and service information and stress on the selling functions of the business. We see how the diversified backgrounds of the owners combine to produce a streamlined and profitable organization based

AT-A-GLANCE
Sentry
TANK GAUGES
REMOTE READING
INDOORS • OUTSIDE
UNDERGROUND
ACCURATE, DEPENDABLE, WEATHERPROOF GAUGES
Easy to install...Easy to read!
Unaffected by specific gravity changes or variations, Sentry Remote Gauges accurately indicate liquid level at all times. Simplified mechanical operation eliminates unnecessary fittings, bulbs or levers for serviceman to tamper with as well as his need for access to building. Remote Gauge may also be combined with At-A-Glance Direct Gauge, shown below, for readings at both tank and remote location if desired. Non-corrosive, stainless steel and brass extension lines connect tank float with heavy-duty cast aluminum, weatherproof, thermometer type indicator — calibrated in fractions. Unconditionally guaranteed. Write for descriptive literature.
Type D-O and D-10 Gauge for basement tank installations with 2" and 1½" openings respectively.
Type D-U Gauge for underground tank installations. Fits 2" openings only.
Sentry AT-A-GLANCE GAUGES
For accurate DIRECT tank readings
Fastest selling, most popular gauge in the industry. Simplified mechanism eliminates gears, cams, springs and magnets that wear out and cause trouble. Durably constructed with patented assembly featuring unbreakable, fog-proof, heavy-duty double plastic domes with printed calibration scale between for clear, easy-to-see readability from any direction. Gauge is Underwriters' Listed and will withstand in excess of 70 lbs. air pressure per sq. inch. Entire unit is non-corrosive and guaranteed leakproof under pressure filling and against defective operation, workmanship and materials. Quick, simple to install even on partially filled tanks. Write for complete descriptive literature.
AT-A-GLANCE
OIL GAUGE
KRUEGER Sentry GAUGES
GREEN BAY • WISCONSIN

the editor's notebook

(continued)

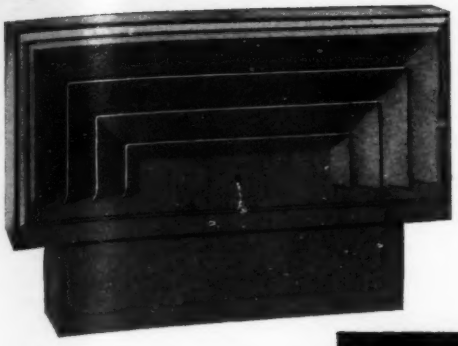
on good employee relations and modern merchandising methods.

Memorial . . .

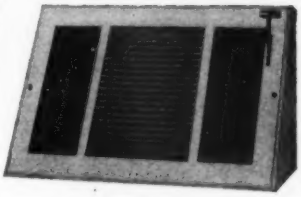
AND WE visit an impressive memorial to the war dead in Don Riley's article, *Baltimore Stadium Presents Tribute in Stainless Steel.* The author presents some statistics which show that 5000 lb of stainless steel was used in fabricating the large letters for the inscription, requiring 1910 man hours to produce a dramatic and useful monument. We learn something of the techniques used in fabricating, handling and mounting the letters and the aluminum seal, and of the ingenuity and planning which went into production of the edifice.

Combustion . . .

AND WE learn *How to Measure Flue Gas Losses* in order to set up standards for fuel burning equipment. S. Konzo and H. D. Bareither conduct a step-by-step outline of the measuring procedures, leading off with an explanation of the fundamentals of combustion and following up with adaptations of the principles to finding flue gas losses as related to burner operation. One of a series of articles designed to help dealers make accurate heating estimates under varying conditions, the article defines the effects of combustion, describes the tools needed and their application, presents flue gas loss curves and outlines a set of standards for burner performance broken down in terms of flue gas losses.



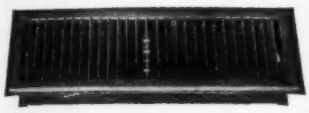
#99
BASEBOARD BALANCED-FLOW PERIMETER DIFFUSER
In the wall for new construction. Out of wall for older homes.



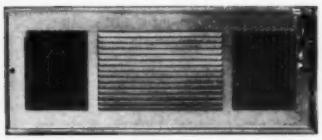
#843
PERIMETER BASEBOARD DIFFUSER
3¼" PROJECTION
Sizes
10 x 6 12 x 6
14 x 6

Midco Leads in Perimeter Heating with the COMPLETE Line

Send for catalogue and a complete description of Midco's FREE dealer mailing service—available to all jobbers.

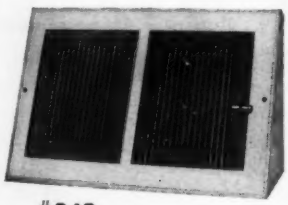


#512
PERIMETER FLOOR REGISTER
Sizes:
2¼ x 10 4 x 10 6 x 10
2¼ x 12 4 x 12 6 x 12
2¼ x 14 4 x 14 6 x 14

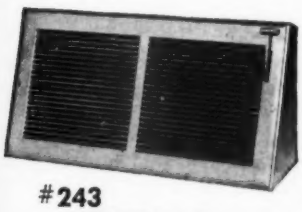


#80
PERIMETER SIDEWALL DIFFUSER

#84
PERIMETER BASEBOARD DIFFUSER
Sizes:
10 x 6 12 x 6
12 x 4 14 x 6



#343
VERTICAL FIN PERIMETER BASEBOARD DIFFUSER
3¼" PROJECTION
Sizes:
10 x 6 14 x 6
12 x 6 14 x 8



#243
HORIZONTAL FIN PERIMETER BASEBOARD DIFFUSER
3¼" PROJECTION
Sizes:
10 x 6 14 x 6
12 x 6 14 x 8

#900
BALANCED-FLOW DIFFUSER
Needs NO quadrant dampers to balance system
Stock Sizes: 2¼ x 12 Length: 17" - 24" - 30" - 36"

GET IT FROM YOUR JOBBER

SOME JOBBER TERRITORIES STILL OPEN

MIDCO
REGISTER CORPORATION
1059 GRAND AVE. - ST. PAUL 5, MINN.

the editor's notebook

(*continued*)

Home Buyers Want Year 'Round Systems

WHAT DO TODAY'S home buyers want most in their new houses? One feature prospective buyers are definitely interested in, according to a recent survey conducted by *House & Home,* is year 'round air conditioning. Some 81 percent of those questioned replied "yes" to the question *Would year 'round air conditioning be worth $800 more?* Another trend brought out by the survey is a desire for larger houses, with approximately 87 percent of the respondents indicating a preference for homes with three or more bedrooms.

Sees 150,000 AC Systems Installed in '55

CLOUD WAMPLER, who only a few months ago predicted that this year would see 125,000 complete home air conditioning units installed, has revised his estimate upward to 150,000 such installations. Mr. Wampler, chairman and president of Carrier Corp., stated that retail sales of central residential air conditioning equipment during the early months of 1955 were approximately double those for the same period last year. Sales of central systems for residences for the entire year 1954 totalled approximately 75,000, he said.

He predicted that by the end of next year, with the sharp gain in sales of central systems and continuing gradual increases in room air conditioner purchases, about 3,000,000 homes will be equipped with complete or partial air conditioning. By 1960, according to Mr. Wampler's forecast, central air conditioning will be going into homes at a rate of well over half a million annually, with the retail volume for this type of installation amounting to more than $800 million. And 10 years from now he anticipates that sales will have increased to 1,150,000 central systems annually.

"Within the next decade," he stated, "we will see a revolution in complete home comfort as far-reaching as the changes in the American pattern of living brought by the automobile. Today there are nearly 20 million single-family homes equipped with central heating. And the time when we can count an equally large number of central air conditioning systems will come sooner than many people now believe."

Gives Tips On Business Management

I RECENTLY heard Roy C. Ingersoll discuss the always interesting subject of *Profit Potentials in an Expanding Market.* Mr. Ingersoll, president and chairman of the board of Borg-Warner Corp., outlined what he considers the half dozen principal ingredients of a successful business operation, and though he was addressing a group of manufacturers, it seemed to me that his remarks might very well be of interest to dealers as well. His six ingredients are: 1) strong management; 2) imaginative research and development; 3) efficient production; 4) fair prices; 5) a hard-hitting organization; and 6) profits.

"This last point — profit — is the basic essential to the success of any enterprise," he said. "Profit makes it possible for us to build strong management, for the very atmosphere of

One Ring—
or thousands . . .
you'll Gain More with
NATIONAL Angle Rings

If you haven't worked with rings rolled by National, you're due for a pleasant surprise . . . for these true rings, guaranteed to fit your job, are:

1. Accurately rolled with uniform curvatures.
2. Easy to fit on the job.
3. Punched with the bolt or rivet holes you need.
4. Available in the metals you use — carbon steels, stainless steels, aluminum, etc.
5. The best value at the best price.
6. Ready for immediate delivery in leg out rings in many sizes.

National rolls to your specifications — angles, channels, tees, rods, flat-bars, pipe and tube —plain, or punched for riveting or bolting.

Tens of thousands of National rings have been used in all parts of the country by large and small sheet metal shops. They are rolled by experts on the most modern high-speed equipment to give you a precision ring at the lowest cost. Write today about your requirements, and the National list of stock sizes and quantity discounts.

Sheet metal fabricating and assembly work is another National specialty organized for YOU. Use it as your stand-by facility.

Phone —
Bishop 7-4255

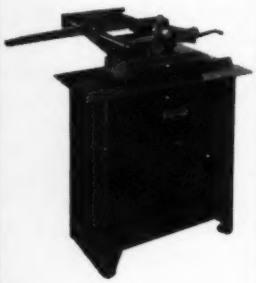
NATIONAL METAL FABRICATORS
2142 S. Sawyer Avenue • Chicago 23, Illinois

the editor's notebook

(*continued*)

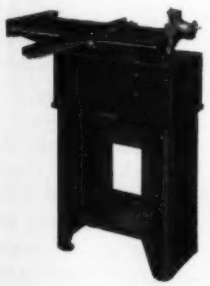
Why settle for HALF when you could save it ALL

The more jobs you do by machine, the lower your production cost, the higher your profit. Here is a partial group of machines made by Lockformer; every one is a *money-maker!* Why not fill out the "blank" spots in *your* production equipment?

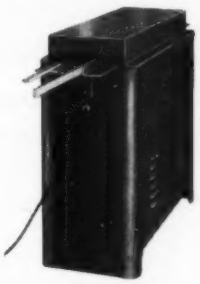


Five Lockformer Models accommodate a variety of auxiliary rolls in addition to built-in Pittsburgh rolls, power flanging and power slitting attachments.

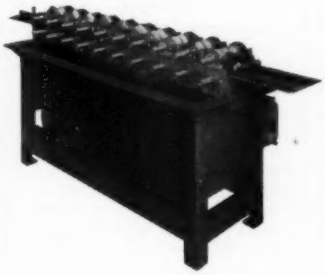
Three Power Flanger models are self-gauging, work to small radius, follow contour of edge being worked automatically.



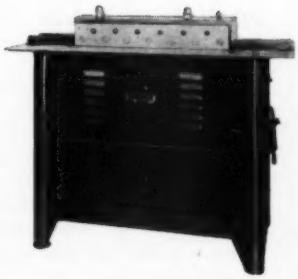
Power Slitter handles any slitting job on sheets up to 48" wide, 20 gauge or lighter, any length, 30 to 35 feet per minute.



Cleatformer fabricates drive cleats, double hemmed "S" cleats, right angles, standing seams and T connections.



Standing "S" Cleat Machine combines a conventional "S" Cleat with a Standing Seam for great strength and rigidity.



Snap Lock Machine makes both offset and receiver lock, any duct or pipe size. A heavy duty machine at a sheet metal shop price.

Write for Free Copy of Lockformer's 20-Page Catalog.

THE LOCKFORMER CO.
4615 West Roosevelt Road Chicago 50, Illinois

the editor's notebook

(continued)

success that surrounds a profit-minded and profit-making company attracts men of vision and ambition and offers the necessary incentive to draw them into the firm."

"Greatest Opportunity" For Today's Salesman

HARRY BOWSER, director of sales education, L. Bamberger and Co., says that salesmanship is facing its greatest opportunity today. Purchasing power is at its peak, he says, and customers are asking for something new — something that will stimulate their pride of ownership. "It's up to the salesman to meet this demand," according to Mr. Bowser.

Cites Benefits of Advertising Program

ADVERTISING and promotion certainly pays off, according to George Duggan. Mr. Duggan says that his company — the East Ohio Gas Co., Cleveland — increased sales of gas incinerators from 1975 units in 1950 to 27,833 units in 1953 through an intensive advertising and promotional campaign. During the four years of the campaign, he said, the cost per sale had been $3 per unit for the gas company and $3.46 shared by manufacturers and dealers.

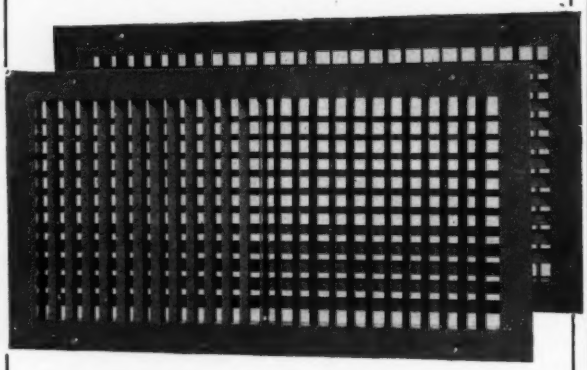
Urges Fuller Use Of Marketing Data

IT SEEMED TO ME that Edward R. Martin had a point when he said that salesmen should make more use of marketing data. Mr. Martin, director of marketing and statistics, Gas Appliance Manufacturers Association, pointed out that with a knowledge of sales and market potentials a salesman can better recognize his own possibilities. "Full use of advertising, promotion and marketing data," he said, "serves to narrow the gap between potential sales and actual sales at the local level."

New Heating and Air Conditioning

GRILLE

With Detachable Volume Control



- **Increased Directional Control**
- **Eliminates Possibility of Tampering or Accidental Changes**
- **Meters Air-flow Accurately**

New features never before available . . . increased directional control, tamper-proof regulating, unmatched beauty, rugged strength and extreme ease of installation.

Extruded aluminum vanes are individually adjustable. Their unique shape provides greater directional control, and reduces air resistance to a minimum. This means more accurate balancing.

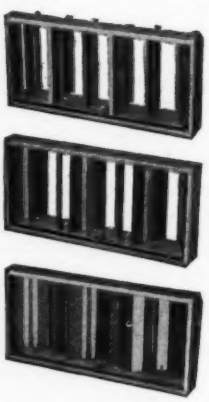
Each vane individually controlled. Operates under spring-loaded tension, eliminating any possibility of deflection pattern being altered by accident or tampering.

Fully-enclosed, wrap-around frame makes grille sturdier, assures easier, safer installation. Entire mechanism is concealed eliminating possibility of "air leaks".

Series "400" A-J Grilles (with — or without volume control) available in any size. Choice of vertical or horizontal louvers only — or combination of both, with either louver in front. Both sets of louvers adjustable without removing grille. Available in prime coat, hammered bronze or metallic gray or any standard finish.

MATCHING RETURN AIR GRILLES AVAILABLE

NEW Detachable Volume Control



Easy to operate. Accurately meters air-flow from a "Whisper" to a "Full Blast"! A volume control you can depend on! Meters the flow accurately at every stage — from fully closed to fully open. No "dead spots". Louvers move simultaneously in opposing directions. Gear-driven action. System may be balanced without removing outer grille. Available with grille, or can be quickly installed later.

For More Information — Call or Write

A-J MANUFACTURING CO.

2119 Washington St. Dept. A-8 Kansas City 8, Mo.

the editor's notebook

(continued)

Says AC Industry to Create 400,000 Jobs

THE GROWING air conditioning industry will create about 400,000 more jobs for American workers by 1960, according to George S. Jones, Jr., managing director of the Air-Conditioning and Refrigeration Institute. Mr. Jones based his prediction on estimates that the air conditioning industry will double its output during the next five years. "The industry currently employs over 400,000 people," he says, "and there will be as many new jobs created by 1960 by the industry as have been created up to the present time."

Says Research to Bring More and Better Jobs

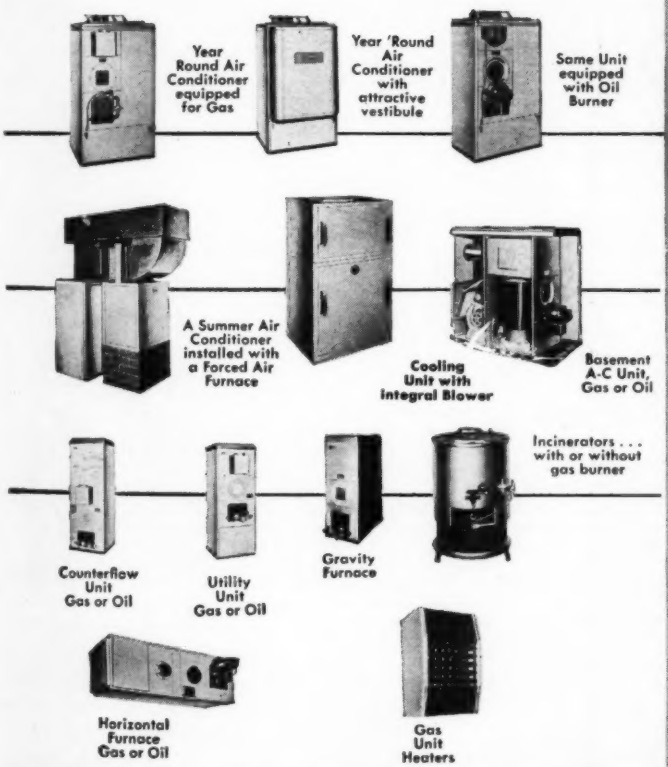
HERE'S ONE suggestion for providing a guaranteed wage that seems to us to have considerable merit. Roger M. Blough, new chairman of the board of United States Steel Corp., feels that research "offers the only road to finding out how to produce more and better goods cheaper; and finding out how to produce more and better goods cheaper is the proven way of guaranteeing more and better jobs and wages — contractual devices to the contrary notwithstanding."

Mr. Blough points out that

Why Experiment— *it costs money!!*

YOU CAN BE RIGHT THE FIRST TIME

with Luxaire®


Year Round Air Conditioner equipped for Gas
Year 'Round Air Conditioner with attractive vestibule
Same Unit equipped with Oil Burner
A Summer Air Conditioner installed with a Forced Air Furnace
Cooling Unit with Integral Blower
Basement A-C Unit, Gas or Oil
Incinerators . . . with or without gas burner
Counterflow Unit Gas or Oil
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Horizontal Furnace Gas or Oil
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The largest, most complete line of Heating . . . Cooling . . . Year 'Round Air Conditioning

Ever Available at NEW . . .
. . . LOW competitive prices

You get what you want—with Luxaire!

Whatever type or size of unit is needed, you can get the *right* Luxaire unit to meet that need.

The price will be competitive, the product excellent—because Luxaire's volume production is also efficient production that saves you money.

And you get the complete package with Luxaire. Whether for heating, cooling or year 'round air conditioning—Luxaire units are complete, compact—and have eye appeal.

For easier installations with trouble-free, customer-satisfying performance, you're *always right*—with Luxaire!

See your Luxaire jobber for your complete heating and air conditioning needs—and for colorful, compelling Luxaire catalogs and mailing pieces that streamline your selling job.

Most Luxaire Units Approved to Burn Either Gas or Oil

THE Luxaire® C. A. OLSEN MANUFACTURING COMPANY • • ELYRIA, OHIO
HEATING & AIR CONDITIONING UNITS

the editor's notebook

(continued)

during the past 10 years of economic abundance for increasing numbers of people, American industry spent almost three times as much on research as had been spent for this purpose in the previous history of the country — some $13 billion, as compared with an estimated $41/2 billion from the founding of the U. S. until 1946.

Hold International Meeting on Combustion

THE SUBJECT of combustion is apparently of worldwide interest. We note that the recent conference held at Massachusetts Institute of Technology, sponsored jointly by Great Britain's Institution of Mechanical Engineers and the American Society of Mechanical Engineers, drew visitors from Australia, Germany, Italy, France and the Netherlands as well as Great Britain and the United States. Objects of the conference, which is to be repeated in London October 25 to 27 were 1) to link theory and practice in the sphere of combustion by presenting the results of theoretical work to practical engineers in America, Great Britain and other countries; and 2) to provide an opportunity for the practical engineers in these countries to get together to discuss practical applications of theory in the fields of furnaces, internal combustion engines, etc.

Scientists "Invading" Business World

I READ with much interest a copy of a speech on the entry of scientists into the business world sent me by Dr. Dean E. Wooldridge. According to Dr. Wooldridge, we are in the early steps of what will within the next 20 years begin to look like "a second industrial revolution, characterized by the wide-scale application to business and industry of automation techniques." He points out that thousands of men trained as scientists or research engineers, who normally would not have considered working in other than a few highly technical areas, were forced by the exigencies of World War II to see some of the outside world, and to learn that they could find interesting and challenging problems in broad operational situations.

Dr. Wooldridge sees great promise in what he termed "the scientists' invasion of the business world," noting that the scientifically trained man brings to business a keen analytical ability as well as the capacity for learning.

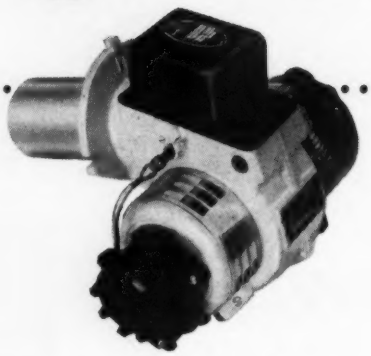
Sheet Metal Firm Wins Recognition

OUR ATTENTION has been called to a recent issue of the Rochester Chamber of Commerce magazine featuring an article about William J. Schmitt's sheet metal company. Artisan ran a story about this progressive contractor some two years ago (September 1953 issue), and it's nice to know that his home town, too, has recognized his achievements. The Schmitt firm is a "family" corporation, with Mr. Schmitt, his two sons and a daughter all serving as officers and all actively engaged in its operation.

Clyde M. Barnes

EDITOR

7 *new models*



1 Over 20 different firing combinations . . . with the new "Spitfire" made especially for furnace and boiler manufacturers. That's Model F-285, Nu-Way's newest. Firing range: .65 to 2.85 gallons per hour.

fit any job . . .

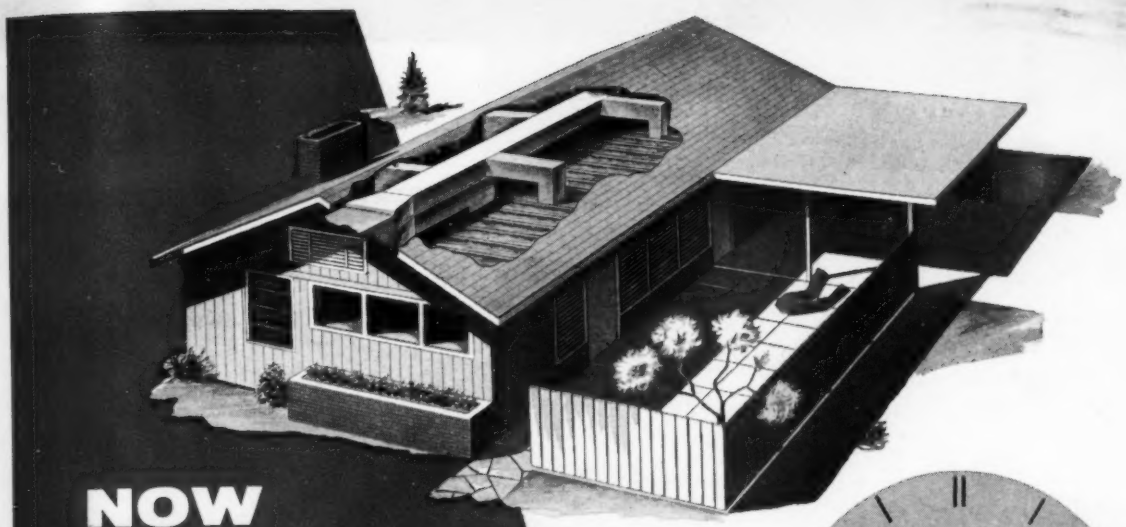
		MODEL
2	.65 to 1.75 gal. per hr.	IXL-175
3	1.75 to 3.0 gal. per hr.	IXL-300
4	2 to 5 gal. per hr.	XLO-500
5	3 to 8 gal. per hr.	CO-800
6	8 to 15 gal. per hr.	XL-1500
7	15 to 20 gal. per hr.	XL-2000

There's a Nu-Way Oil Burner to fit almost any job — large or small, residential or commercial. Every model is engineered with features like 0.0015 inch motor pump alignment . . . sand-cast aluminum alloy housing . . . dependable transformers, manufactured extra-heavy by Nu-Way . . . easy servicing . . . in-operation nozzle adjustment . . . adjustable floor, flange or mounting. No wonder Nu-Way burners are standard equipment on boilers and furnaces made by so many leading manufacturers! Write today for Bulletin N1132 on new oil burners.

THE *Nu-Way* CORPORATION
ROCK ISLAND, ILLINOIS

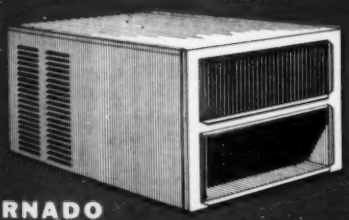
OIL HEATING EQUIPMENT

Nu-Way is a member of O.H.I. and I.B.R.
"Automatic Oil Heat Exclusively Since 1921"



NOW you can AIR CONDITION 5 or 6 room houses in ONE DAY

Vornado's® NEW RESIDENTIAL AIR CONDITIONERS



VORNADO
Residential Air Conditioners

Vornado makes it possible for you to install a complete air conditioning system in homes ranging from 1,000 to 1800 sq. ft. in one day. Vornado has completely packaged all necessary components for the job and makes installation extremely simple.

Duct work problems have been simplified with Vornado's new patented prefabricated Vornadoduct. You can completely air condition 5 and 6 room homes with Vornado for as little as 60¢ a square foot including cost of unit, duct work, and installation.

The prefabricated Vornadoduct is available for installations requiring separate duct work. Made of ¾" Fiberglas, Vornadoduct is assembled by merely folding pre-scored sheets together and sealing the edge with tape. Moisture barrier and insulation qualities are extremely high.

Available in both 2-H. P. and 3½-H. P. sizes, Vornado residential air conditioners are designed and manufactured for use in FHA mortgage-insured properties. They are completely self contained, air cooled, and need only to be connected to electrical supply to begin functioning.

THE O. A. SUTTON CORPORATION
1812 West Second Street
Wichita, Kansas

Sure I'm interested. Send me complete details about Vornado's new, low-cost, simplified Air Conditioning.

NAME OF COMPANY_____

ADDRESS_____

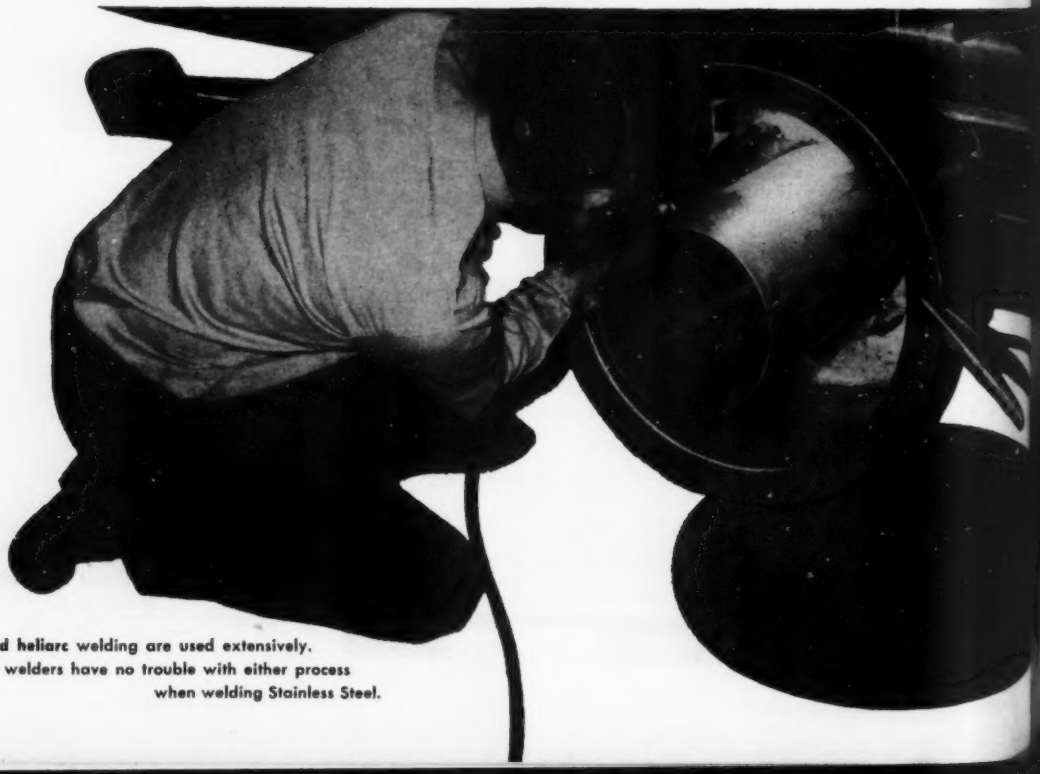
CITY_____ STATE_____

SIGNED_____ POSITION_____

Products of
THE O. A. SUTTON CORPORATION
Wichita, Kansas
Specialists in the manufacture of comfort cooling appliances

One set of

This standard 10′ shear is used for both carbon steel and Stainless Steel. It easily handles 10-gauge Stainless Steel.



Electric and heliarc welding are used extensively. Good welders have no trouble with either process when welding Stainless Steel.

machinery does the job for carbon or Stainless Steel

AT YOUNG MACHINERY COMPANY, MUNCY, PA.

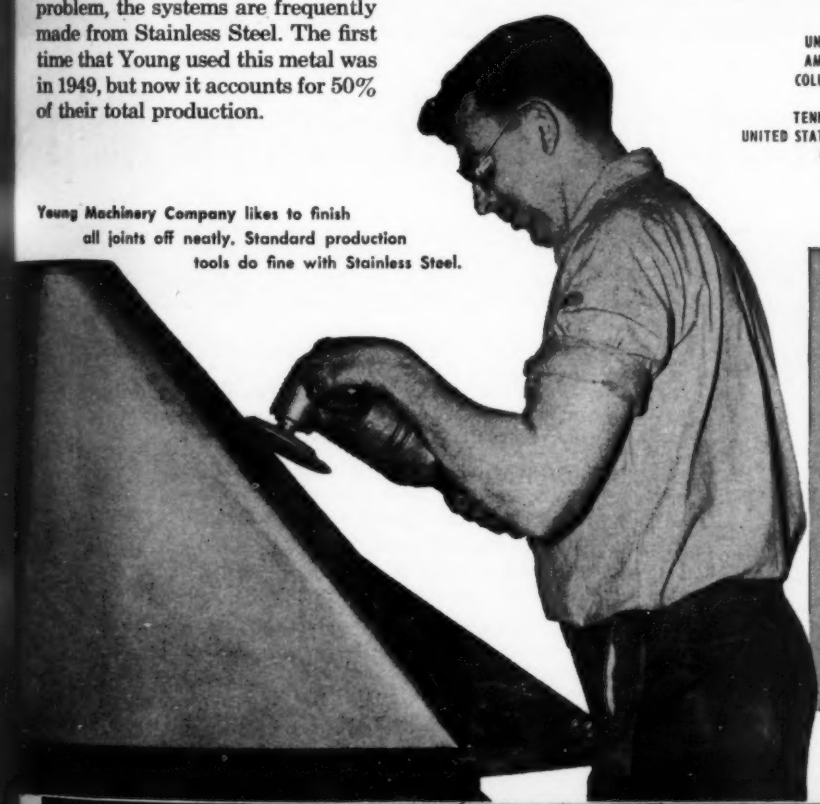
Young Machinery Company makes a unique line of Transvair air conveyors that transfer dry, free-flowing materials through tubing, and ducts. Energy is furnished by a turbine fan, and the entire system is sealed so that hazardous and toxic substances can be safely handled.

Since, in the chemical and food industries, contamination is often a problem, the systems are frequently made from Stainless Steel. The first time that Young used this metal was in 1949, but now it accounts for 50% of their total production.

But here's the interesting part: they didn't have to buy any new equipment, and they didn't have to modify any older fabricating equipment. The existing machinery is used interchangeably for carbon or Stainless Steel. According to W. W. Corson, Assistant Manager, "We have had absolutely no difficulty fabricating Stainless Steel, and we don't expect any."

No other metal combines the easy fabrication, corrosion resistance, high strength and easy-to-clean beauty of Stainless Steel. And when a new design is in the wind, remember that United States Steel has the nation's largest assortment of Stainless Steel shapes, sizes, types and finishes.

UNITED STATES STEEL CORPORATION, PITTSBURGH
AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



Young Machinery Company likes to finish all joints off neatly. Standard production tools do fine with Stainless Steel.

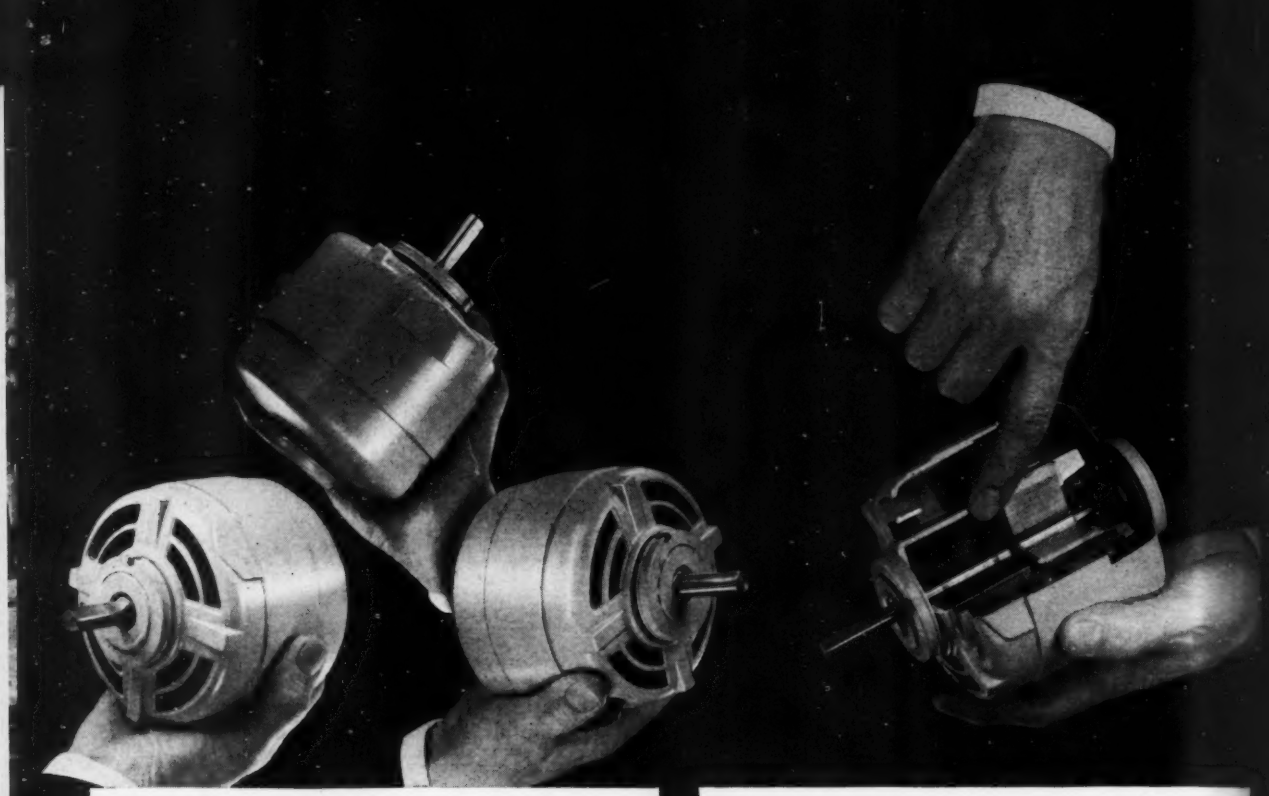
USS STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS
PIPE · TUBES · WIRE · SPECIAL SECTIONS

USS

UNITED STATES STEEL

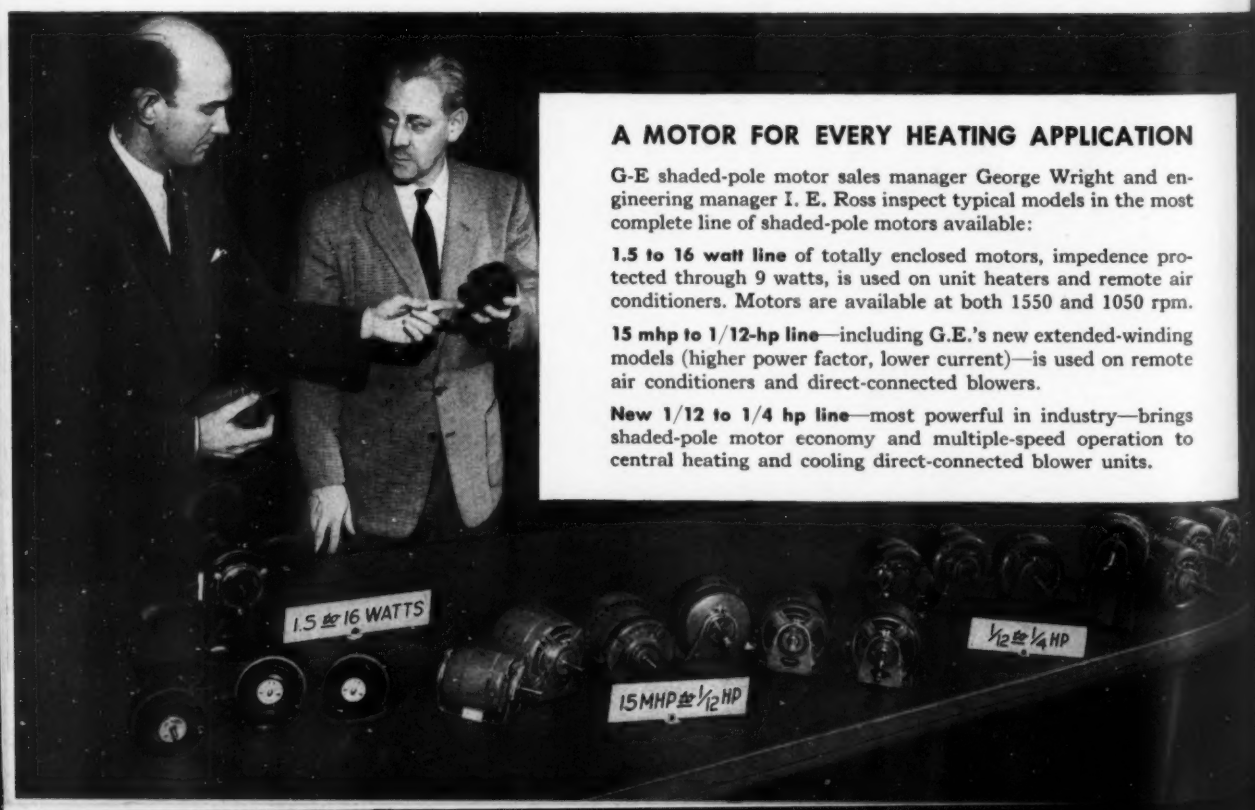
See "THE UNITED STATES STEEL HOUR"—Televised alternate weeks—Consult your newspaper for time and station.



1 ALL-ANGLE OPERATION provided by sealed-in lubrication and advanced bearing designs permits mounting G-E shaded-pole motors shaft up, down, at any angle.

2 SEALED-IN LUBRICATION minimizes motor maintenance and contributes to long motor life by protecting bearings from foreign materials and improper oiling.

These advanced design features help



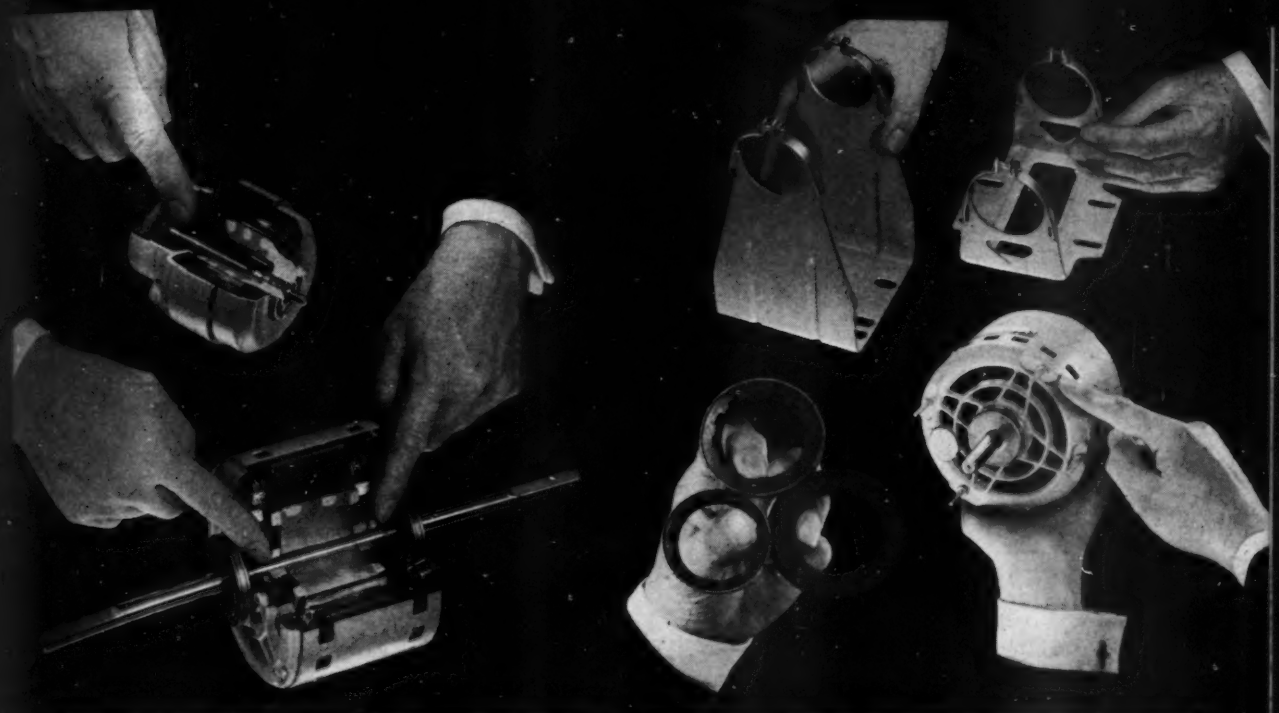
A MOTOR FOR EVERY HEATING APPLICATION

G-E shaded-pole motor sales manager George Wright and engineering manager I. E. Ross inspect typical models in the most complete line of shaded-pole motors available:

1.5 to 16 watt line of totally enclosed motors, impedence protected through 9 watts, is used on unit heaters and remote air conditioners. Motors are available at both 1550 and 1050 rpm.

15 mhp to 1/12-hp line—including G.E.'s new extended-winding models (higher power factor, lower current)—is used on remote air conditioners and direct-connected blowers.

New 1/12 to 1/4 hp line—most powerful in industry—brings shaded-pole motor economy and multiple-speed operation to central heating and cooling direct-connected blower units.



3 UNIT BEARING for smaller motors provides larger bearing area, positive rotor alignment. **TWO-BEARING DESIGN** in larger motors has same forced oil re-circulation.

4 THREE-WAY MOUNTING is offered on most G-E shaded-pole motors: cushion end-rings, through-bolts, resilient cradle bases. Extra-high bases are also available.

make G-E shaded-pole motors best for your direct-drive fans and blowers

INDUSTRY'S MOST COMPLETE LINE . . . 1.5 WATTS TO 1/4 HP

You see above some of the outstanding features of General Electric shaded-pole fan motors which help assure maximum product life of your heating equipment. Now, check these other reasons why leading heating-equipment manufacturers make G-E shaded-pole motors the low-cost answer to more compact, more saleable products:

COMPACT, HIGH-QUALITY DESIGNS—Created by G.E.'s widely experienced motor engineers, these shaded-pole motors are built to high G-E standards. Unit-bearing design in smaller ratings and two-bearing design in the 1/12- to 1/4-hp line each provide the optimum in compactness, quietness, and long life.

LONG-LIFE BEARINGS—G-E shaded-pole motors bring you the benefits of sealed-in lubrication. Oil grooves in shaft provide positive lubrication of filtered oil to bearing surfaces.

COOLER OPERATION—Improved ventilation of G-E shaded-pole motors results in longer life through cooler bearings and windings. Higher efficiency (lower heat loss) of 1/12- to 1/4-hp line simplifies provision for motor ventilation in your products.

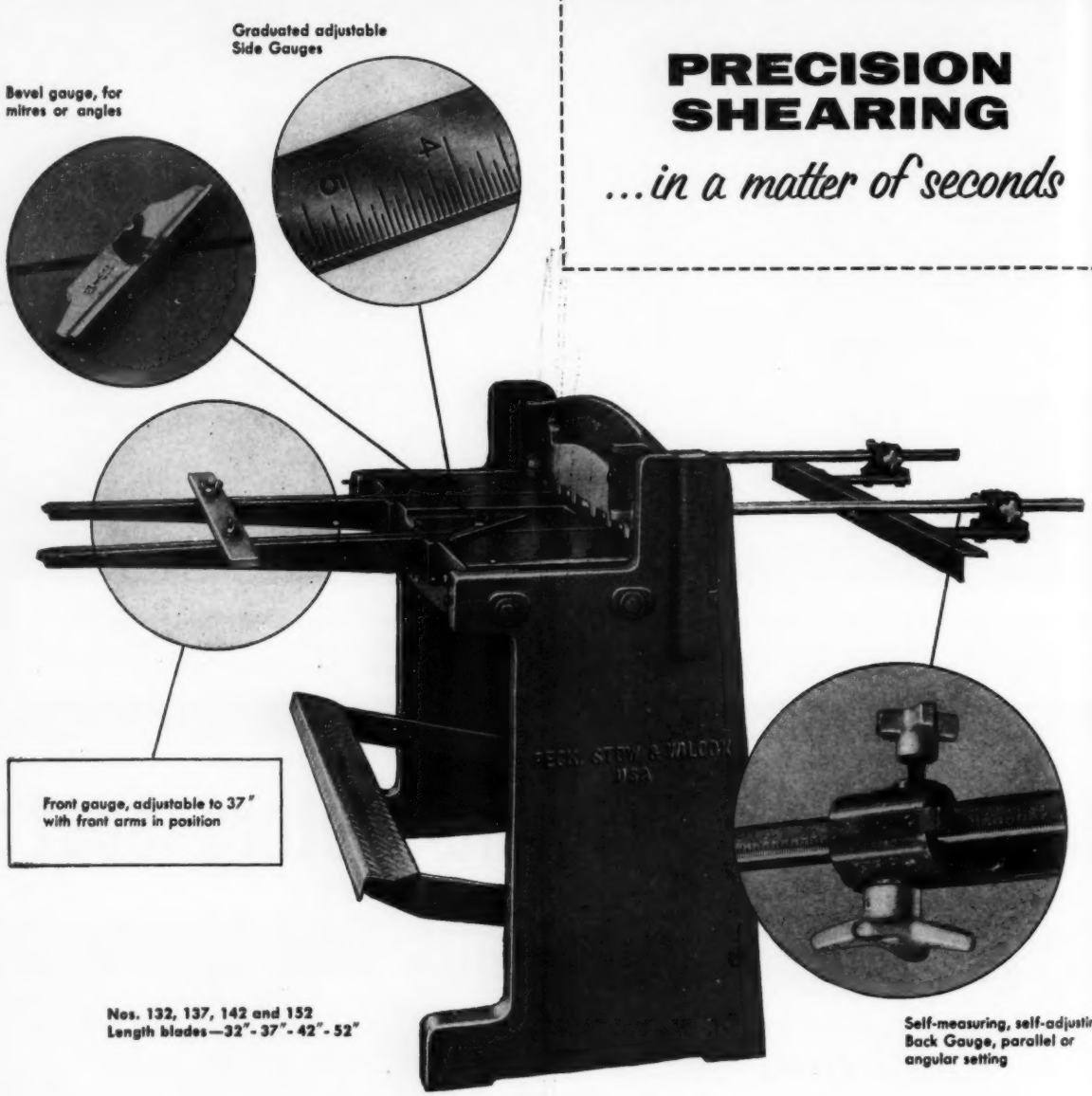
EXPERT APPLICATION HELP from G-E engineers is available to you. For **complete** shaded-pole motor service, contact your local G-E Apparatus Sales Office early in your planning when G-E engineers can help most. And write for bulletin GEA-6134 to Sect. 704-51, General Electric Co., Schenectady, N. Y.

Progress Is Our Most Important Product

GENERAL ELECTRIC

PRECISION SHEARING

...in a matter of seconds


Graduated adjustable Side Gauges
Bevel gauge, for mitres or angles
Front gauge, adjustable to 37" with front arms in position
Nos. 132, 137, 142 and 152 Length blades—32"-37"-42"-52"
Self-measuring, self-adjusting Back Gauge, parallel or angular setting

with PEXTO foot squaring shears

Manufactured in the traditionally high standards of one of New England's oldest companies, the new Pexto Foot Squaring Shears is built of rugged, heavy machine tool grade castings. It cannot "spring" or twist out of line. Complete gauging—side, bevel, front and back—offers fast, accurate setting for precise reproduction of squared or mitred blanks. Capacities up to 16 gauge. For more complete information, write today.

THE PECK, STOW & WILCOX COMPANY, SINCE 1785, SOUTHINGTON, CONNECTICUT, U.S.A.

Forecast $4¼ Billion Jump In Construction Volume

THE GOVERNMENT predicts that spending on construction will shoot up about $4¼ billion this year to an unprecedented $41.8 billion. The prediction by the Commerce and Labor departments was based on economists' expectations that business will continue throughout the last half of this year at its present record rate. The new forecast was a sharp upward revision since last November, when government economists foresaw a $2 billion rise in building outlays this year. Since then, monthly construction reports have indicated peak activity in the building business. The present construction record is last year's $37.6 billion. Only a "moderate" price increase was figured into the 11 percent rise now foreseen during this year, the new report said, indicating that nearly all the increased spending would represent actual building. The forecast contemplates that federal spending on construction will decline by more than 10 percent this year but that state and local outlays will offset this decline, rising to a record $83¾ billion. The report foresaw adequate mortgage funds at relatively easy interest terms, and good supplies of all building materials during this year. The biggest dollar rise was foreseen for new dwelling units, expected to account for $14.6 billion of total construction outlays this year, a rise of 21 percent over the previous dollar record in 1954. It was predicted that approximately 1,300,000 new private nonfarm dwelling units would be started this year, second only to the 1,350,000 units started in 1950. The biggest percentage increase — 44 percent — was foreseen for outlays on construction of small commercial buildings such as stores, restaurants and garages.

OHI Works On Pulsation Project

AT A RECENT meeting of the Pulsation Research Steering committee of Oil-Heat-Institute of America, W. R. Dennis of Battelle Memorial Institute showed motion pictures — at roughly 1/20 actual speed — of an oil flame pulsating. A 1 gph 45 deg solid cone nozzle was used. Two separate flames were evident according to the committee's report — 1) the ignition flame, which changed direction considerably; and 2) the cone flame, which moved out of the field of view during the oscillations. The oscilloscope action was calibrated to the sound pressure so that pressure changes could be traced during the oscillations. Further study along these lines is now under way, and when complete data is available, a full report will be made to the industry.

Wholesalers Set Dates, Location for Convention

DATES and location for the fall convention of the National Heating & Airconditioning Wholesalers Inc. have now been set. The Hotel Governor Clinton, New York City will serve as headquarters during the group's annual meeting and convention which will be held November 27 to 29.

SM Apprentice Programs Discussed at Conference

SPEAKERS at the sheet metal sessions of the recent Eastern Seaboard Apprenticeship Conference included Mell Farrell, president, Sheet Metal Workers Local No. 28, New York City, who emphasized the large stake in apprenticeship held by the sheet metal industry, and Herman Wein-

(*Continued on page 22*)

FHA Establishes New Debenture Interest Rate

A ¼ OF 1 PERCENT increase in the rate of interest payable on debentures issued by the Federal Housing Administration has been approved by the Secretary of the Treasury. FHA Commissioner Norman P. Mason said the new debenture interest rate — 2⅞ percent — applies to all mortgages endorsed for insurance on or after July 1, 1955. FHA debentures are guaranteed by the United States. They are issued to lending institutions in payment of claims made by the institutions when mortgages insured by the FHA go into default and the properties are acquired by the commissioner.

To Hold World Symposium On Applied Solar Energy

THE WORLD Symposium on Applied Solar Energy, to be held November 1 to 5 at the Westward Ho Hotel, Phoenix, is expected to attract more than 800 visitors. Sponsors of the meeting are the Association for Applied Solar Energy, Stanford Research Institute and the University of Arizona. Among the papers scheduled by authorities on solar energy are *The Sun's Energy*, Dr. Farrington Daniels, University of Wisconsin; *Survey of the Domestic Uses of Solar Energy*, Dr. H. C. Hottel, Massachusetts Institute of Technology; and *Space Cooling With Solar Energy*, Dr. George O. G. Lof, Denver. Dr. J. E. Hobson, Stanford Research Institute, is scheduled to discuss *The Economics of Solar Energy*. Also planned in a panel discussion on *Solar House Heating*. Panelists include Dr. Harold Heywood of the University of London; Dr. Austin Whillier of the South African Council for Scientific and Industrial Research; Dr. Lof; Dr. Maria Telkes, New York University; Philip Sporn, American Gas and Electric Service Corp.; and Raymond W. Bliss, Jr., University of Arizona.

Republic can help you tackle any kind of fabricating job

No matter how commonplace or how unusual the requirement, fabricators find Republic Steel Sheets ideal for a wide variety of applications. Here are four of Republic's most popular sheets.

Galvanized—with a steel or copper steel base. Particularly suitable for fabricating air conditioning and ventilating systems in any type of building or home. Ideal for many other types of sheet metal work. Highly ductile, easily bent, flanged, or otherwise fabricated. Tight zinc coating assures years of trouble-free service.

Galvannealed—with a steel or copper steel base. Will take paint and lacquer without preliminary treatment. The spelter coating adheres tightly to the base metal so that flaking or peeling does not occur. And the dull surface presents an ideal base for paint. Particularly suitable where product is exposed to weather conditions.

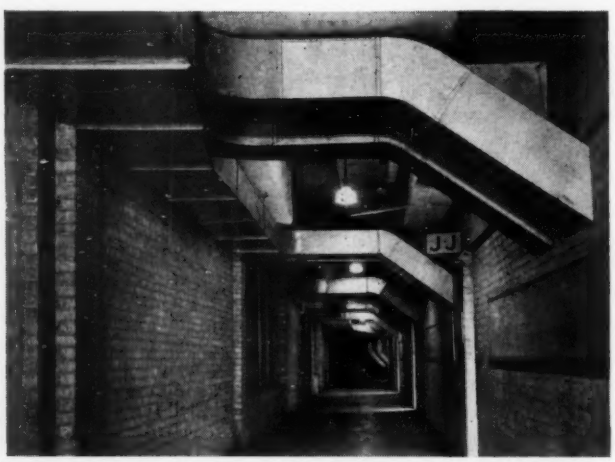
Electro-Paintlok—a zinc-plated, chemically-treated steel sheet designed to take paints, lacquers, synthetic enamels—and to hold them for years. Ideal for jobs where a fine, lasting painted surface is desired. No special cleaning is necessary—only the removal of fingermarks and dirt. Will withstand the most severe forming without flaking or peeling.

ENDURO® Stainless Steel—Of all commercial metals, only stainless steel offers so many advantages. It resists rust and corrosion. It has attractive appearance. It is easy to clean. It is strong and tough—even resists heat. It can be fabricated on your present equipment. And it offers excellent profit possibilities by enabling you to give the "extras" that mean satisfied customers.

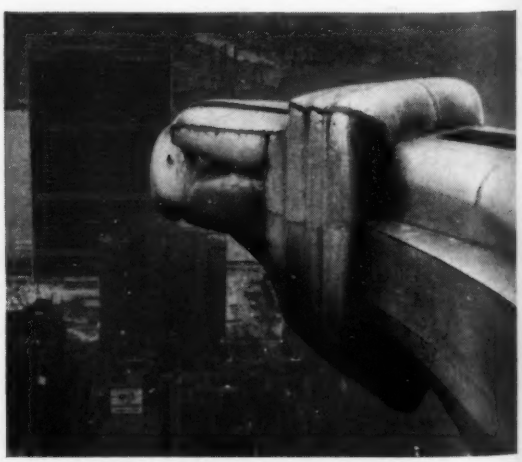
Republic also makes many other sheets including galvanized sheets for roofing and siding, and hot and cold rolled sheets and strip. For fast delivery or additional information, call your nearest Republic Steel Distributor. He'll be glad to help you.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products



GALVANIZED SHEETS—have many applications. For added rust-resistance, use Galvanized with a copper steel base, shown here installed in the main trunk line and exhaust ducts of a ventilating system.



ENDURO STAINLESS SHEETS—provide exceptional resistance to corrosion. Require little maintenance. This unusual application, one of eight gargoyles installed in 1930 on the Chrysler Building, is 25 years old. They still are as good as new—with no corrosion in sight.

FOR JUST THE RIGHT FINISHING TOUCH on any institution or private dwelling, install roof drainage products made from ENDURO Stainless Steel. Fabricated by Republic's Berger Division, the "K" gutters, being installed here, are made of Type 301, 28-gage stainless steel. Under normal conditions they'll last the lifetime of the building. And maintenance is negligible. Send coupon for more facts.

REPUBLIC STEEL

REPUBLIC STEEL CORPORATION
3162 East 45th Street
Cleveland 27, Ohio

Please send more information on:

- ☐ Galvanized Sheets
- ☐ Galvannealed Sheets
- ☐ Electro Paintlok Sheets
- ☐ ENDURO Stainless Steel Sheets
- ☐ (Other)_____
- ☐ ENDURO Roof Drainage Products

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

K-8008

(*Continued from page* 19)

DMS Handbook Published by BDSA

THE BUSINESS and Defense Services Administration has prepared a handbook on the Defense Materials System to help those engaged in supplying their services to the Department of Defense and the Atomic Energy Commission acquaint themselves with general rules applicable to their defense contract operations. Key questions and answers on the essential points of the Defense Material System precede the detailed description and instructions for defense contractors. The Department of Defense requires all of its contractors to agree that they will follow the provisions of applicable rules and regulations of BDSA, including DMS regulations, in the procurement and use of materials required for the performance of their contracts. The booklet, titled *The Defense Materials System in Our American Industry*, may be purchased from the Superintendent of Documents, Government Printing Office or from Department of Commerce field offices at 25 cents a copy.

Speakers Discuss Apprentice Problems

(*Continued from page* 19)

berger, chairman of the Sheet Metal Joint Apprenticeship committee of New York City, who stated that the guiding policy of apprenticeship should be *For the good of the industry*. Other subjects discussed included industrial and labor relations, problems involved in providing an up-to-date apprenticeship program, and improved standards of work processes and related instruction. More welding and soldering instruction was recommended for sheet metal apprentices. The dangers of overloading apprentice rolls were considered as was the question of rotation of apprentices through different shops. The consensus was that rotation should be avoided wherever possible.

Urge Early Start on Planning of Federal Tax Reductions and Revisions

A PROMPT START on planning of Federal tax reductions and revisions that are likely to be possible next year is urged in a new report by the Research and Policy Committee of the Committee for Economic Development, a non-profit economic research and education organization. The CED committee pointed out that with high employment and normal growth of the economy, present tax rates would yield substantially more revenue in fiscal 1957, which begins July 1 next year, than the budget estimate for fiscal 1956. If international and domestic developments do not require large expenditure increases, "there would then be possible a substantial reduction in tax rates" with the cash budget balanced.

"The character of the tax reductions that now appear to be possible for next year will be of great importance both to the efficient operation of the economy and to the objective of fairness among taxpayers," the committee said. "It is urgent that any reductions adopted be carefully thought out beforehand and, where possible, that they follow from generally applicable principles of economic efficiency and fairness. Tax changes adopted for short-run political advantage are always dangerous on economic and ethical grounds."

While the Research and Policy Committee said that first priority should be given to individual income tax reduction in all brackets, with emphasis on more moderate progression, "we feel that the available tax relief next year should be spread over all three of the main contenders for reduction — individual income rates, corporate income rates and excise rates."

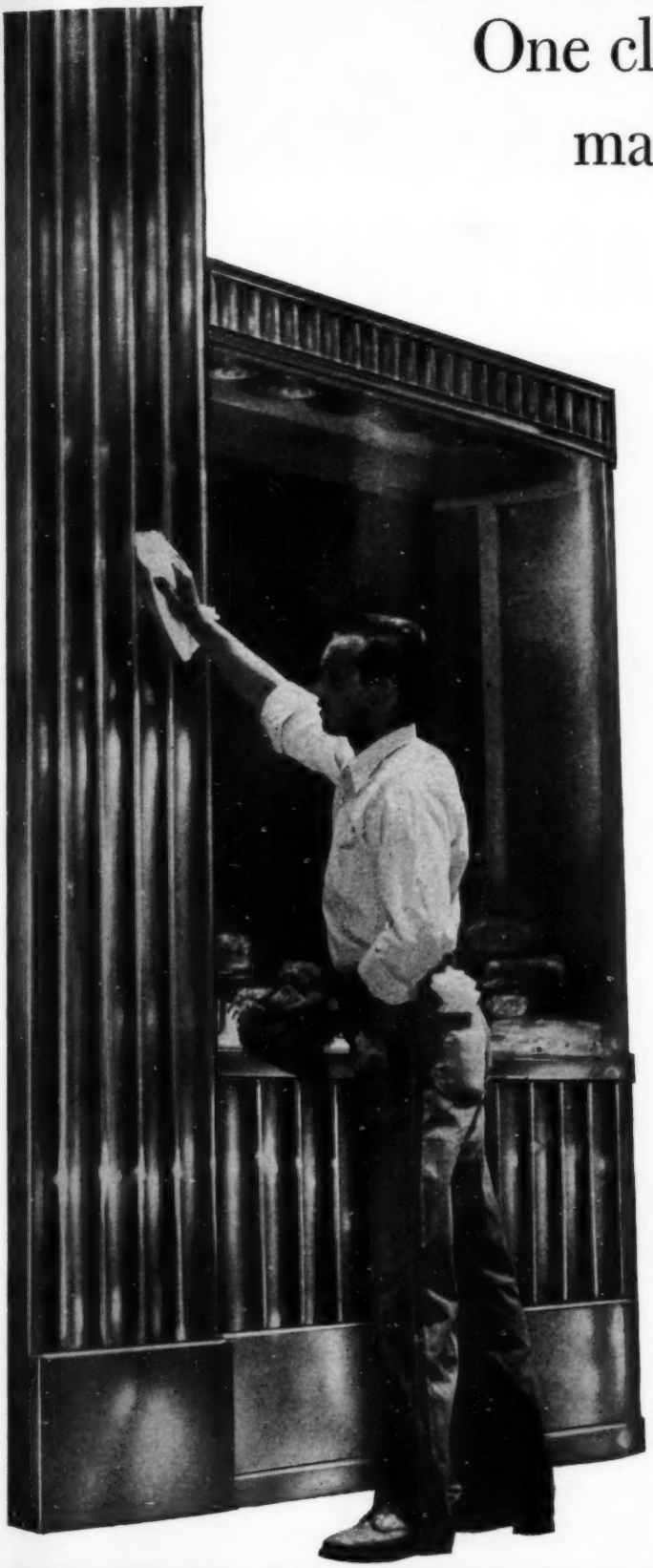
Copies of the report may be obtained from the Committee for Economic Development, 444 Madison Ave., New York 22.

Says Building Rate "Not Surprising"

THE PROBABILITY that 1955 will be the eleventh consecutive year of construction volume increase should not be considered surprising in view of the rapid expansion of the nation's economy in recent years, Thomas S. Holden, vice chairman of F. W. Dodge Corp., recently told the National Federation of Financial Analysts Societies. "As a matter of fact, recent construction volumes have barely kept pace with the growth of the economy," Mr. Holden said. "Last year's record total was only 28 percent over the peak volume of the boom of the 1920's, after allowance is made for the big change that took place in the value of the construction dollar. Since the big boom of the 1920's, population has increased 35 percent, per capita incomes increased nearly 50 percent and total output of goods and services more than doubled. During the 1920's population increased 1,700,000 annually, while last year's increment was 2,800,000 persons. Economic growth is the great generator of construction demand."

Survey Indicates Record Output, Sales for '55

A MID-YEAR survey of major industries conducted by the 25 industry divisions of the Business and Defense Services Administration indicates new all-time high production and sales records will be achieved in 1955. The BDSA industry divisions cover more than 400 manufacturing industries of the United States. A similar survey at the start of the year indicated a general high level of production for the year, but certain industries, including steel and construction, have far exceeded the estimates made at that time.



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In service, stainless steel should be cleaned regularly for best results. A few words of advice to your customers will help assure a lasting attractive appearance.

You can obtain complete information, both for yourself and your customers, from Armco's new fabricating data bulletin, "Cleaning of Stainless Steel." Just fill in and mail the coupon for your free copy.

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YEAR 'ROUND AIR

Gas-Fired Heating-Cooling Unit

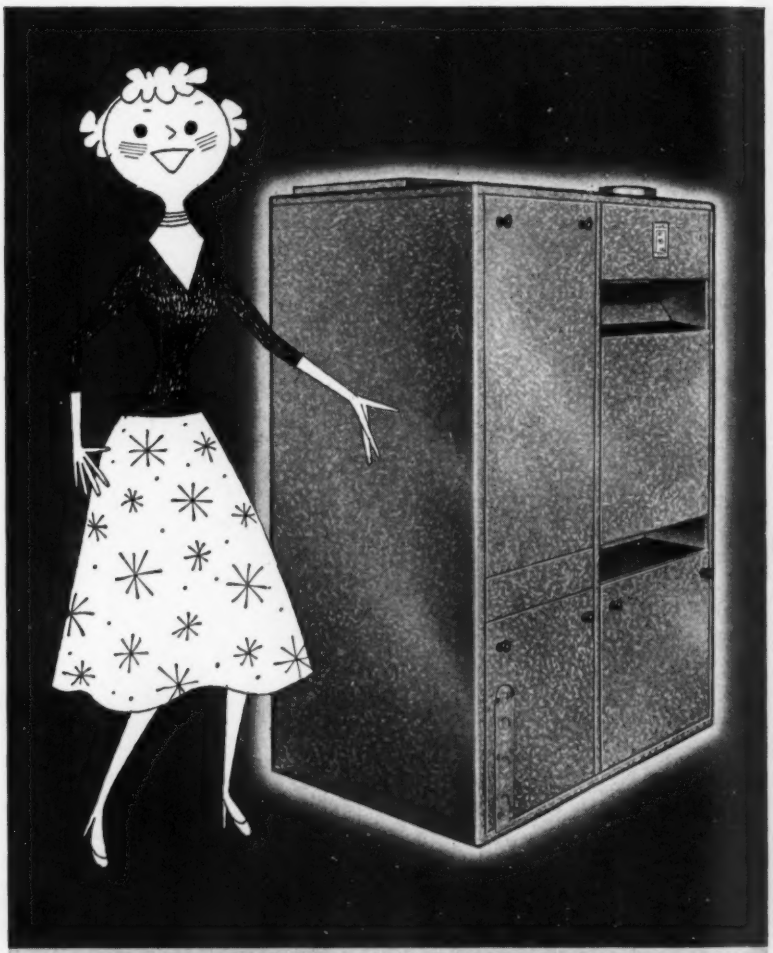
Heating*	Cooling	
75,000 Btu	2 hp	—
100,000 Btu	2 hp	3 hp
125,000 Btu	2 hp	3 hp
150,000 Btu	2 hp	3 hp

*Btu Input

Here—at competitive price—is a famous-brand, top quality year 'round unit that offers a variety of heating capacities with choice of 2 hp *or* 3 hp cooling.

Compact in size, ruggedly built, this model performs efficiently in any style of home . . . can be installed in utility room, closet or basement with only a minimum of floor space required. The complete comfort it provides is a strong selling point for the builder, and a strong incentive to present home owners to replace their old furnaces *now* with year 'round air conditioning.

Available with summer-winter thermostat and manual or automatic summer-winter changeover damper. Unit may be obtained less cooling circuit if desired. The cooling circuit is covered by American-Standard Five Year Protection Plan.



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Refrigerant circuit is packed separately for convenient handling.

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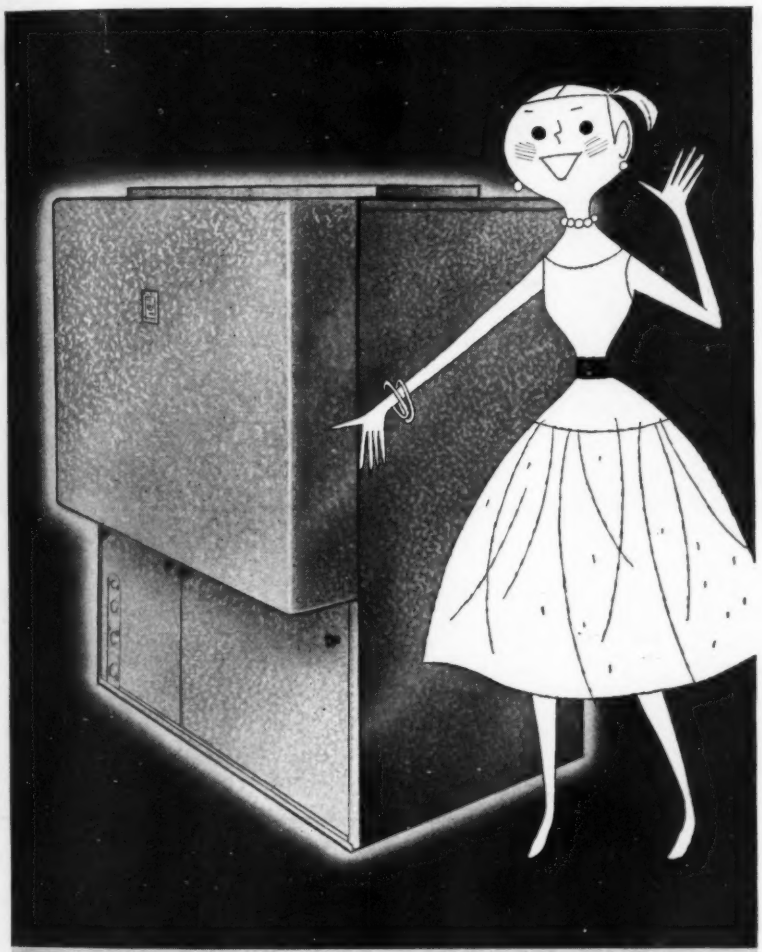
under "Air Conditioning Equipment" or "Furnaces"

ANNOUNCES 2 NEW CONDITIONING PACKAGES



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Oil-Fired Heating-Cooling Unit

Heating*	Cooling	
85,000 Btu	2 hp	3 hp
112,000 Btu	2 hp	3 hp

*Btu at Bonnet

American-Standard's new oil-fired combination summer and winter air conditioner offers flexibility as to relative heating and cooling capacities. It enables the new home builder or the present home owner to achieve the utmost in year 'round comfort at lowest cost consistent with top-brand quality.

Handsomely styled, compact in design, this unit can be installed in any type of home wherever a few square feet of floor space is available—utility room, closet or basement.

Not only does this model excel in performance—it's competitively priced to sell fast. Features include manual or automatic summer-winter changeover damper, and summer-winter thermostat. The cooling circuit is covered by American-Standard Five Year Protection Plan. Unit is available with or without cooling circuit.

AMERICAN-Standard

AIR CONDITIONING DIVISION

ELYRIA, OHIO

American Radiator & Standard Sanitary Corporation

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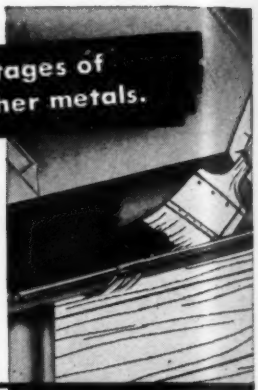

1. Terne requires no special surface preparation or special primer and can be painted immediately.

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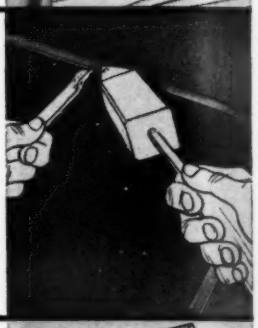
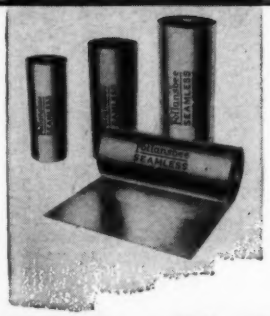


3. Follansbee Terne is easy to solder. The tin-lead alloy coating forms a perfect joint.

4. Follansbee Terne is more ductile—easy to form and handle.

5. Terne has proof of its long life. Many installations are in service after 100 years.



6. Follansbee Terne comes in ten different widths from 4″ to 28″. You'll save money by saving shearing time.

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Washington Letter

FTC's Proposed Air Conditioning Rules Meet Opposition

By Arnold Kruckman

Disagreement on definitions and on factors in industry to which rules apply stir lively discussion

THE FEDERAL Trade commission held a trade practice conference in Chicago some weeks ago (as reported on page 19 of the June Artisan) to determine several things but apparently chiefly a definition for air conditioning. The call for the conference stated that the industry to be covered under the proposed rules is engaged in "the sale and installation of mechanical refrigeration units and equipment for commercial or industrial use, and/or mechanical air conditioning units and equipment for commercial, industrial, or home use." It stressed that "the word 'installation' as used in this paragraph involves engineering service."

It would seem obvious from the above — and it was quite evident at the meeting — that the FTC erred seriously in omitting from the "call" any reference to the heating industry, which is so much more involved in the air conditioning of any type of building, and in the distribution of air conditioning equipment, than is straight refrigeration.

The rules suggested for consideration deal with commercial bribery; deception as to what is "new"; substitution of products; deception as to terms and conditions of sales; warning of limitations and hazards; deceptive pricing and guarantees; and discrimination in price, services, etc.

A public hearing was planned following the conference, at which the proposed rules could be made available to anyone interested. Commissioner Robert T. Secrest was designated to preside and FTC Counsel Paul Butz guided the conference.

The Chicago meeting came to an unexpectedly swift and early conclusion. The fundamental conflict in the views between those in attendance was found to be difficult to reconcile. Members of the warm air heating industry who attended the conference pointed out that they are the primary group involved in residential air conditioning because of their technical experience in handling air and its distribution, their knowledge of sheet metal fabrication, their technical skills and facilities, and because they are making the great majority of home air conditioning installations. The representatives of the large mechanical (heating, piping and air conditioning) contractors in attendance pointed out that air conditioning includes year 'round temperature control, and this includes heating — involving such equipment as the boilers for a large building, as well as many other components of an air conditioning system which have nothing to do with commercial refrigeration. The mechanical (heating, piping and air conditioning) contractor representatives also pointed out that their work includes the erection and installation of the refrigeration compressors. The refrigeration industry members felt they had a primary interest in air conditioning work because they are involved with the mechanical cooling equipment in some cases, particularly the smaller packaged units.

Another difference in viewpoint expressed at this meeting was in what comprises an "industry member." That is, would the proposed rules apply only to manufac-

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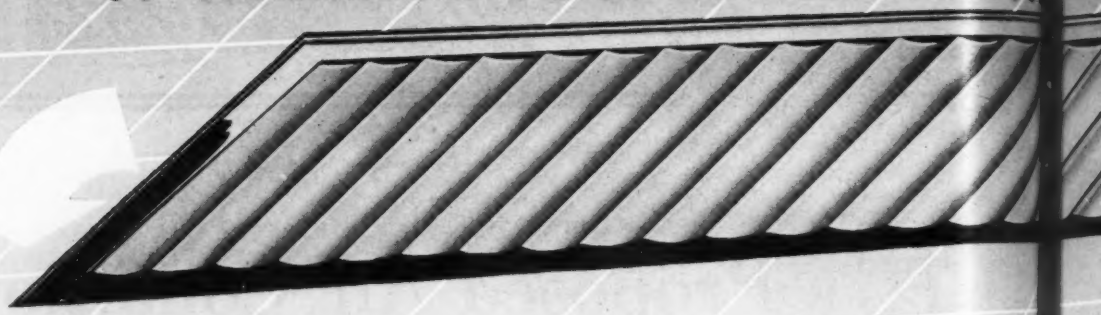
OF WARM OR COOL FORCED AIR..



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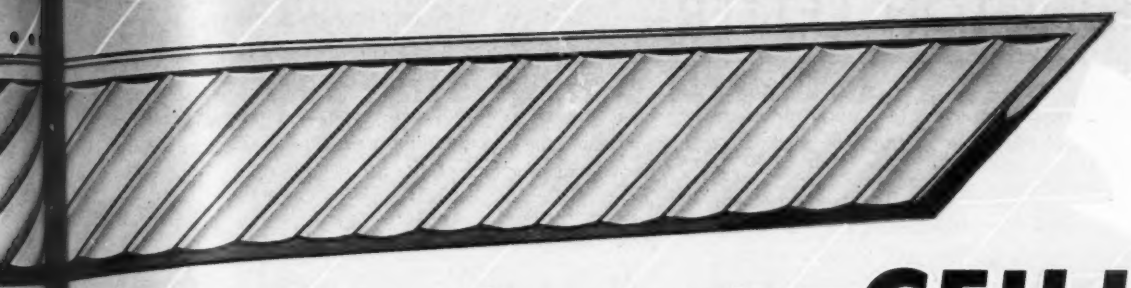

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from the FLOOR

WASHINGTON LETTER—

(Continued from page 27)

turers, or to dealers and contractors too, whose practices and problems are not the same as those of the manufacturers?

The entire session therefore tended to bog down for want of a definition of air conditioning, and a definition of an industry member. Then and there, a meeting was called to be held in Washington for the purpose of adopting such definitions.

It was assumed by many of those at the Chicago session that all of the trade and technical organizations concerned with air conditioning, as well as other members of the industry, and representatives of the labor unions, and others would be invited to the Washington meeting, which was held late in June at the headquarters of the FTC. The exact status of the Washington meeting never was quite clear. It was said to be entirely private, with no official significance, and no records would be kept of its proceedings or of the units or persons participating. Under the circumstances, the number of those present was indeterminate and never was properly recorded in character or number. The formula of "no records" was followed and therefore only one definite result is assumed to have come out of the meeting — an air conditioning definition was voted upon and accepted. This definition for air conditioning is that which had been earlier published by the American Society of Heating and Air-Conditioning Engineers in the 1955 *Guide*: "The simultaneous control of all, or at least the first three, of the following factors affecting both the physical and chemical conditions of the atmosphere within a structure: temperature, humidity, motion, distribution, pressure, dust, bacteria, odors, toxic gases and ionization."

As may be easily understood, this very informal manner of reaching a conclusion was quite unsatisfactory to many of those present. Many of those with a vital major concern in the issues felt the "private" Washington meeting failed entirely to supply the definitions whose need became so obvious at the more official "private" Chicago conference in May. Further action will depend largely on the initiative of the members of the industry and their trade organizations.

It is thought by some members of the warm air heating and residential air conditioning industry that a set of rules governing all phases of the air conditioning industry is clearly outside the jurisdiction of FTC because the contracting phases of it, at least, are not engaged in interstate commerce.

The "product" of the contracting phase of the air conditioning industry involves the sale, engineering, installation and servicing of equipment used in an air conditioning system. Use of equipment which may have been involved in interstate commerce does not make the building subject to interstate commerce regulations, they say. There have been a number of decisions handed down by federal courts to this effect, they report, and on this basis the FTC would seem to have no legal basis for contemplating formulation of a set of rules to govern the contracting end of the air conditioning industry.

New Construction Record Seen

New construction in 1955 is expected to reach $41.8 billion, almost 11 percent above last year's record of $37.6 billion, according to revised outlook estimates prepared jointly by the business and defense services administration and the bureau of labor statistics of the department of commerce. These figures come from the building materials and construction division and are prepared under the direction of the construction statistics and economics branch of the division.

It is particularly interesting that private expenditures will unquestionably increase by 14 percent over 1955 to $29.5 billion. These revised estimates, issued late in June, according to the joint statement of the departments of commerce and labor, reflect the unprecedented volume of construction activity this year, far above the levels of earlier expectations. All agencies responsible for the data emphasize that there will be virtually no abatement in the present rate during the remainder of 1955.

Almost any source will tell you that business in general, as well as consumers' disposable income, will also be maintained throughout 1955 at peak levels. Most forecasts indicate that mortgage funds will be adequate, on relatively favorable terms, despite anticipation of heavy demand on the credit and capital markets occasioned by continued economic prosperity. The building materials and construction division of BDSA tells us that except for rather widespread spot shortages of cement and gypsum wallboard, nationwide supplies of all building materials will be sufficient for the rest of the year. (Spot shortages of gypsum wallboard are not expected to be factors in completion of many housing projects.) They tell us in preparing the 1955 estimates, costs were assumed at levels only moderately above those of last year.

In passing, it is interesting to note that about 1,300,000 new private nonfarm dwelling units are either started or in process of being started this year, a figure exceeded only by the 1,350,000 private units begun in 1950. On a seasonally adjusted basis, private starts were at an average annual rate of about 1,400,000 during the first quarter of 1955; the 21 percent increase over 1954 in dollar outlays for private dwelling units reflects an increase in construction costs, together with a trend toward larger and more expensive homes.

Other types of private construction which are strongly influenced by the growth and movement of population — schools, churches, stores, offices, professional buildings, service stations, utilities and the like, are also expected to break records in 1955. Commercial building probably will show the sharpest increase from 1954 —

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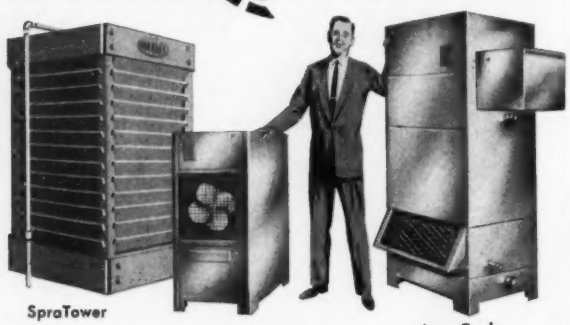

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WASHINGTON LETTER —

30 percent — rising to nearly $2.9 billion. Following closely will be religious building, which is likely to expand by a fourth to about $750 million.

Private Industrial Building Up

More money will be spent in 1955 than in 1954 on private industrial buildings, reversing the gradual downtrend of the past three years. Considerable increase in outlays for modernization of existing facilities is forecast. The survey predicts increased private spending for hospital construction and much more construction work on military bases, as well as very considerable increase in spending by state and local government.

The word is that private industrial construction in 1955 is expected to reach $2.2 billion, 8 percent above 1954. The total to be spent for warehouses, office and loft buildings is forecast as $1.075 billion or 12 percent above 1954. Stores, restaurants and garages in 1955 are estimated at a total of $1.8 billion, or 44 percent above 1954. Other private non-residential building is expected to involve an expenditure of $2.21 billion, 10 percent above 1954. Next comes religious buildings, $750 million, 26 percent higher than in 1954; hospital and institutional, $370 million, 10 percent higher than in 1954; social and recreational, $265 million, 16 percent higher than in 1954; and miscellaneous, $325 million, 1 percent higher than in 1954. Incidentally, industrial non-residential building with public funds is estimated at $870 million for 1955; and public educational building is estimated at $2.55 billion.

The construction statistics and economics branch's statistical study reveals that all types of construction shared in the 7 percent rise between May and June; however, most of the increase came from expansion in store building, house construction and highways. For the first half of the year the types of construction activity showing the greatest advances over the year were store buildings, 42 percent; housing, 34 percent; churches, 33 percent, and public schools, 19 percent. Private construction as a whole this year was 20 percent higher than last, comparing the first six months, while public construction was about the same. In May of this year $88 million worth of new warehouses, office and loft buildings and $146 million in stores, restaurants and garages were built; in June $89 million worth of warehouses, offices and loft buildings, and $168 million in stores, restaurants and garages were constructed.

Breakdown By Area

Of the structures built in 1955 in northeastern United States, a million dollars worth were supplied for amusement buildings; another million dollars for commercial garages; $1.5 million for gasoline and service stations; $9 million for office buildings, and $11 million for stores and other mercantile buildings. In the north central

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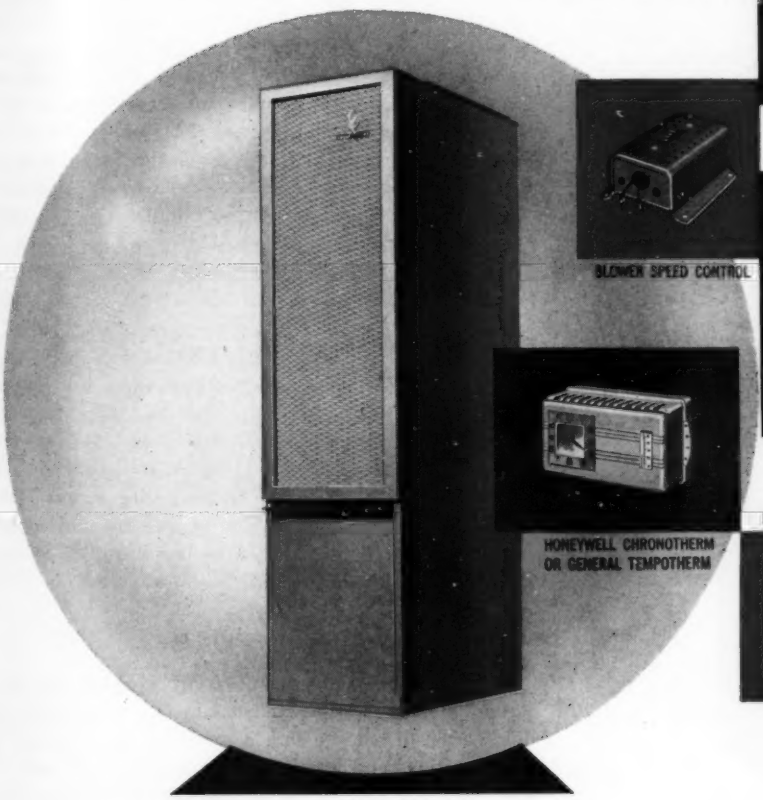

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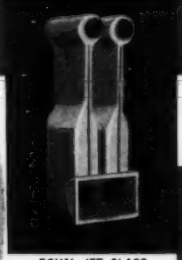

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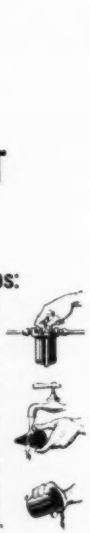

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WASHINGTON LETTER —

states amusement buildings absorbed $2 million; commercial garages, $1 million; gasoline and service stations, $3.5 million in buildings; $7 million was invested in office buildings, and $25 million in stores and other mercantile buildings. In the South they spent $8 million in amusement buildings; $1.5 million on commercial garages; $3.3 million on gasoline and service stations; $8 million on office buildings, and $21 million on stores and other mercantile buildings. The West used $3 million for amusement buildings; $1 million for commercial garages; $2 million for gasoline and service stations; $13 million for office buildings, and $23 million for stores and other mercantile buildings. California absorbed $210 million in all types of buildings; Florida, $62 million; Georgia, $24 million; Illinois, $63 million; Indiana, $20 million; Kentucky, $35 million; Maryland, $44 million; Massachusetts, $20 million; Michigan, $55 million; Missouri, $37 million; New Jersey, $79 million; Ohio, $94 million; Pennsylvania, $90 million; Texas, $122 million; Virginia, $50 million; Washington, $37 million, and Wisconsin $27 million. The largest sums for private business buildings of various sorts in 1955 thus far were spent in Los Angeles, New York, Chicago, Detroit, San Francisco, Washington, D. C., Baltimore and Cleveland in the order named. It may be interesting to learn that Chicagoans spent $1.383 million on gasoline and service stations; $2.846 million on office buildings; $3 million on stores and other mercantile buildings.

What's Status of Housing Bill?

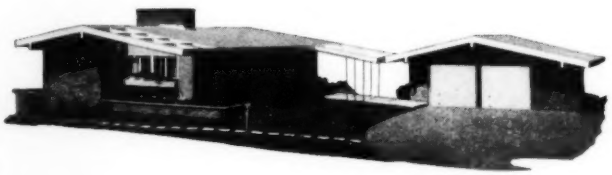
At this writing, the members of Congress are uncertain in regard to the immediate fate of the housing bill. They will tell you that it carries a lot of unneeded appropriations and legislation that many groups wish to shed. A great deal of opposition has developed to the insistence that 35,000 public housing units a year be supplied for the next two years, no matter what happens after that time. This is the particular demand that already has been made by the President. There is bickering over the so called non-controversial home mortgage insurance authority for the Federal Housing Administration. The administration is peeved over the fact that the committees have abolished the strong slum clearance feature. And the effort to make the Home Loan Bank board an independent agency like the Federal Reserve board, increasingly gains opposition. The American Federation of Labor is putting on one of its most determined drives to force the House to adopt the Senate's bill.

Commissioner of Education Brownell wants $16,846,000 immediately to put up schools in 90 communities of 24 states. The funds would be spent in Alabama, Arizona, Arkansas, California, Connecticut, Florida, Georgia, Illinois, Kansas, Maryland, Missouri, Nevada, New Mexico, North Carolina, Ohio, Oklahoma, Rhode Island, South Dakota, Tennessee, Texas, Utah, Virginia, Washington and Hawaii.

This Ad is appearing in August, 1955 HOUSE & GARDEN MAGAZINE

Here's the New *Duo-Classic* thermostat

...Effortless Control of Summer and Winter Air Conditioning!



Duo-Classic Year-Round Air Conditioning Controls were selected for the 1955 House of Ideas. A milestone in the progress of all season comfort, this system will bring efficiency, ease of use and beauty into your home.

The Classic thermostat is a companion-piece to the Duo-Classic. It is designed for superior control of *either* winter or summer air conditioning. Both Classic and Duo-Classic control systems are available through your builder or air conditioning contractor.

It's handsome . . . *and so easy to use.*

In your new home, or your newly air conditioned home, you'll be happier with the Duo-Classic thermostat.

Engineers, architects and decorators have cooperated to create this thermostat which will hold the selected temperature within a fraction of a degree; eliminate complicated switching and actually add to the *beauty* of your home.

A great advantage of the Duo-Classic control system is the Universal Control Panel which accommodates any type of heating, any type of cooling, in any climate. This means easier, less expensive installation and simplified operation for you!

You'll be proud to have the Duo-Classic in your home. It will add pleasure and comfort to your living. Discuss Duo-Classic year-round air conditioning control with your builder or contractor.

This is the consumer announcement of a brand new year-round air conditioning control system!

AND HERE IS HOW IT WORKS ▶

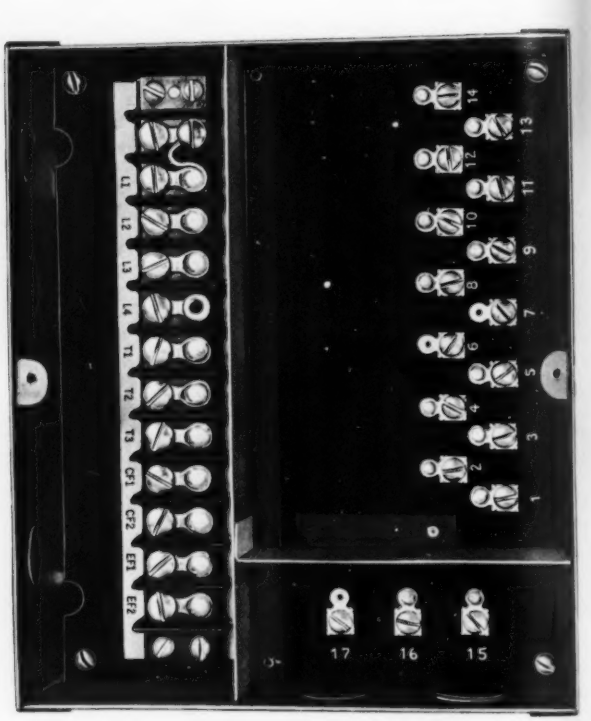
Copyright 1955 by Detroit Controls Corporation

"Packaged Efficiency"—

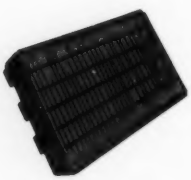
describes the *Duo-Classic* Control System!

One Panel accommodates every combination of air heating and cooling components!

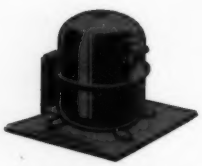
DETROIT Universal Control Panel is provided with high voltage and low voltage terminal strips for direct connection of the power supply line



and—



Condenser or cooling tower

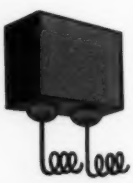


Compressor motor

Change-over damper (self powered)

Evaporator fan

Electrical overload trip



High-low pressure cut out

By-pass damper (self powered)

Duo-Classic Thermostat

(Optional components from Detroit Controls)

More Benefits For The Entire Industry In This New Concept of Comfort Control!

For the whole air conditioning industry, Duo-Classic is an answer to the need for a simplified, more easily installed, less expensive control system. It brings all-season air conditioning one step closer to the desired "standard equipment" status!

Terminal locations on the Detroit Universal Control Panel are arranged so that the entire installation is simplified . . . it can be understood at a glance! Terminals are provided—prewired—for every function or component in the entire air conditioning system.

For the Manufacturer:

The efficient Duo-Classic control system will reduce your base cost, help you lower the tag-price, cut your assembly time and increase the useful efficiency of your air conditioners. This adds up to a better, more saleable product!

For the Contractor:

You can figure on less time for installation when you specify Detroit's Duo-Classic control system for all-season air conditioning. Lower costs and less chance for mistakes on the job are real advantages. Homes you equip with Duo-Classic will be more comfortable and more valuable!

Existing heating controls

. . . and other components installed in the air heating-cooling system.

For the Supplier:

Since the Duo-Classic thermostat together with the Detroit Universal Control Panel will provide superior control for a great many different types of air conditioning jobs, your inventory requirements are simplified! This efficient, flexible control system will be popular . . . promote it and increase your sales!

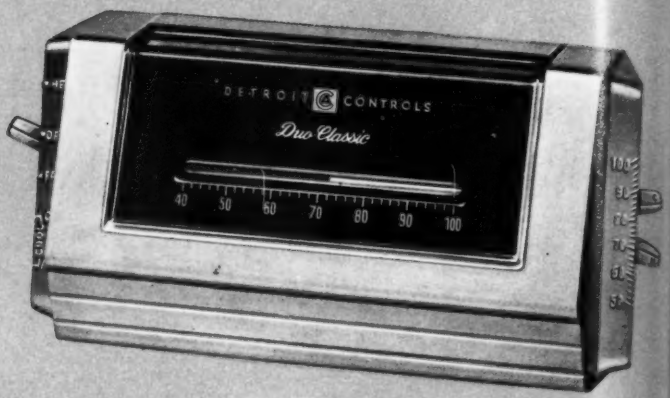
For the Home Owner:

You'll thank your lucky stars *your* home has the efficient Duo-Classic Control System! All temperature regulation and selection of heating, cooling or ventilation are set at the handsome Duo-Classic thermostat. It will be your "silent servant" for comfort.

This is another new product of

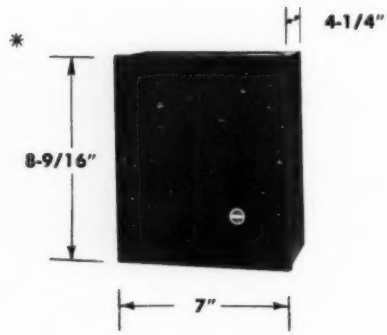
DETROIT CONTROLS Corporation

For Complete—All-Season Air Conditioning Control



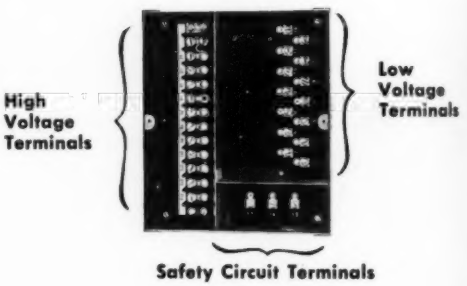
You need only Install the DETROIT Universal Control Panel and the *Duo-Classic* thermostat

It's the NEWEST ★ MOST EFFICIENT ★ COMPLETE control system!



Install the Universal Control Panel on or near the air conditioning unit

*Slightly larger size for models above 5 h.p.



Terminal locations are set up for efficiency. Understood at a glance . . . Easy to work with!

SPECIFY ★ SELL ★ INSTALL . . . the Duo-Classic all-season air conditioning control system—for simpler, quicker installation . . . *more* Efficiency and Customer Satisfaction!

DETROIT CONTROLS CORPORATION
5900 TRUMBULL AVE. • DETROIT 8, MICHIGAN
Division of AMERICAN RADIATOR & STANDARD SANITARY Corporation

Representatives in Principal Cities • Canadian Representatives:
RAILWAY AND ENGINEERING SPECIALTIES, LTD.,
Montreal, Toronto, Winnipeg.

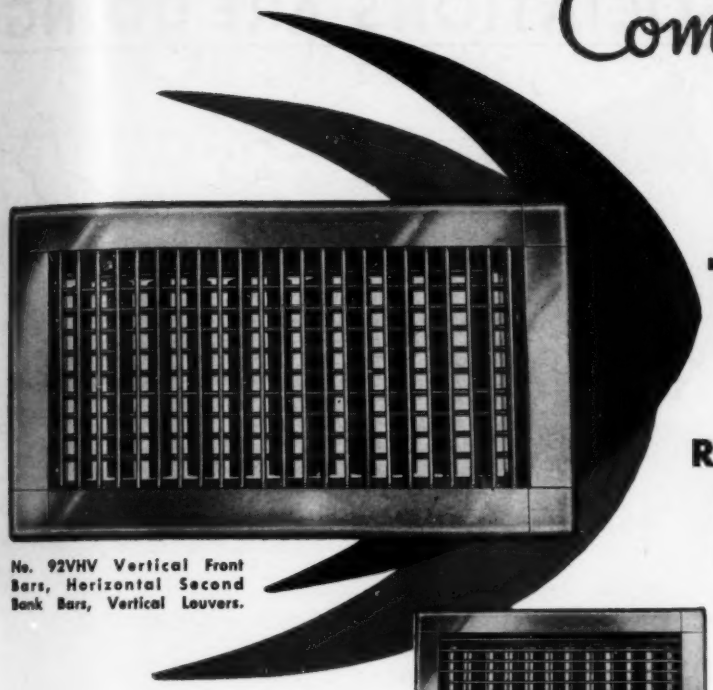
AUTOMATIC CONTROLS for REFRIGERATION
AIR CONDITIONING • DOMESTIC HEATING • AVIATION • TRANSPORTATION • HOME APPLIANCES • INDUSTRIAL USES

Form No. 1666

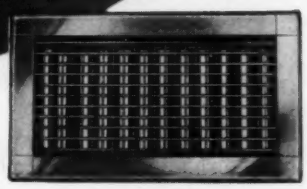
Coming Soon...

TRIPL-AIRE

The GRAND NEW SERIES OF REGISTERS & GRILLES FOR COMMERCIAL INSTALLATIONS



No. 92VHV Vertical Front Bars, Horizontal Second Bank Bars, Vertical Louvers.



No. 92HVV Horizontal front bars, Vertical second bank bars, Vertical louvers.

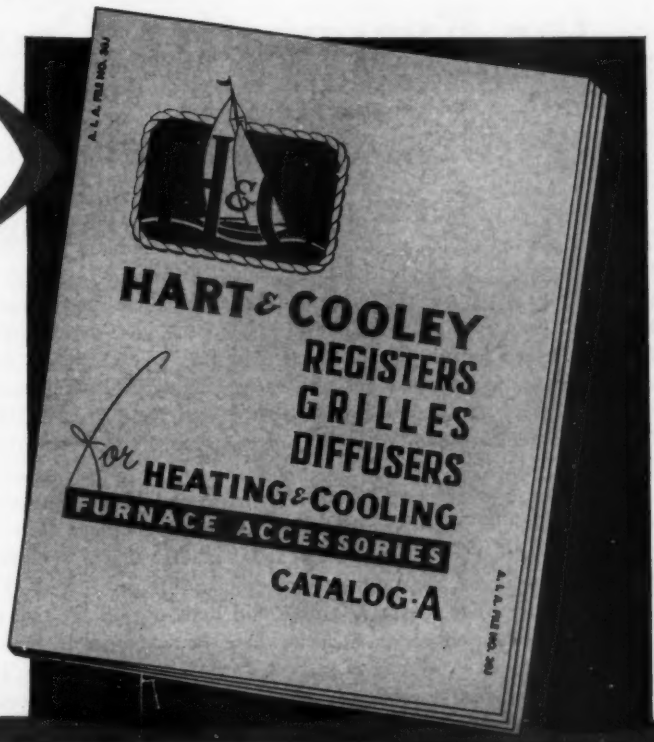
26 STANDARD SIZES

EACH AVAILABLE IN 10 COMBINATIONS OF VERTICAL AND HORIZONTAL FACE BARS AND LOUVERS

Watch for the New...

H&C CATALOG

... which includes details of the TRIPL-AIRE series and pertinent facts concerning the finest registers and grilles for each and every type of heating and cooling installation. It also contains much helpful data. It will soon be off the presses.



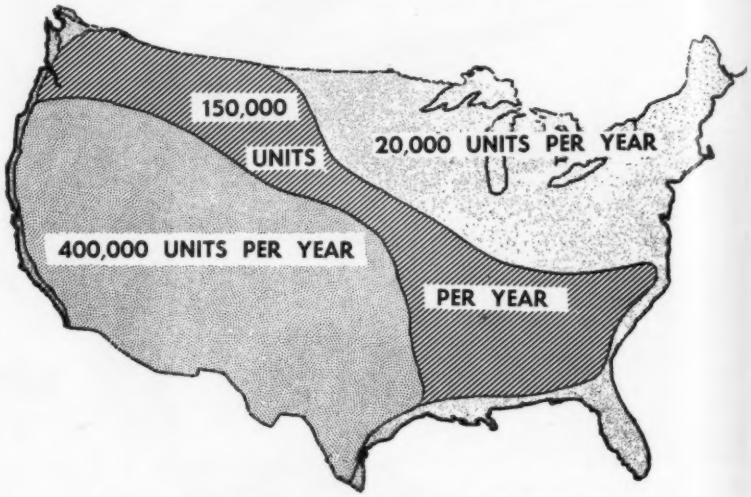
HART & COOLEY MANUFACTURING CO. 500 EAST 16TH ST. HOLLAND, MICHIGAN

PRODUCT OF THE WORLD'S LARGEST and MOST PROGRESSIVE PRODUCERS OF REGISTERS and GRILLES

Tells Engineers

at

San Francisco —



SALES DISTRIBUTION of evaporative coolers (1954 estimate). Approximately 85 percent of the total are residential units

"You're Overlooking Uses for Evaporative Cooling"

Speakers at lively ASHAE panel session see wider application of method despite limitations

THE engineering profession has not recognized evaporative cooling, except in the Southwest, and has not applied it in many parts of the country where it can be used to advantage, according to Robert S. Ash, of the International Metal Products Co., Phoenix, Ariz. He spoke at a well-attended panel session on evaporative cooling held during the semi-annual meeting of the American Society of Heating and Air-Conditioning Engineers in San Francisco.

The reason is that most engineers seem to feel that evaporative cooling may be used only when it can meet the indoor standards of temperature and humidity that can be obtained with air conditioning systems using mechanical refrigeration, he said. This would limit use of evaporative cooling only to those areas where the outdoor wet bulb does not exceed 70 F.

However, evaporative cooling is widely used for relief from excessive summer temperatures in such cities as Atlanta, Tulsa and Dallas, he said. In fact, there are no geographical limitations in its use, in his opinion, except in such places as the Red Sea and Persian Gulf areas, where wet bulb temperatures are in the middle 80's.

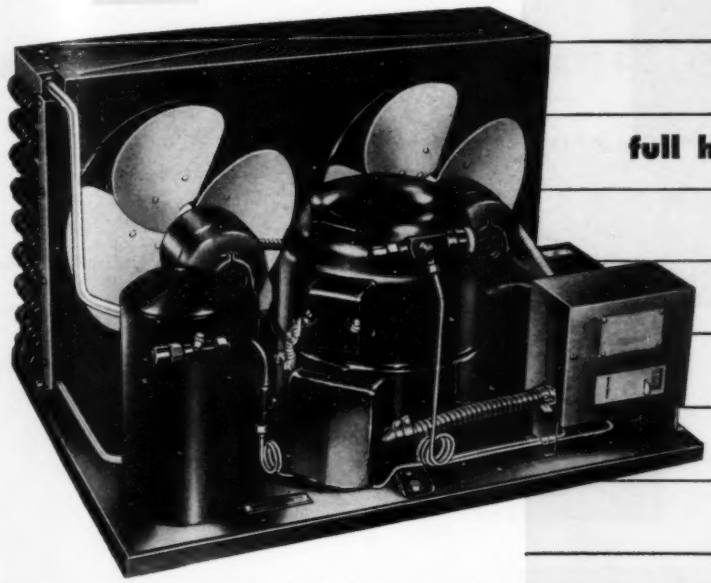
Mr. Ash said ideal standards of indoor temperature and humidity — as indicated by the ASHAE comfort chart — should not be applied when considering "relief cooling" by the evaporative method. Such standards refer to optimum comfort, but it should be remembered that "comfort doesn't suddenly diminish on each side of the optimum condition." He said a feeling of comfort is experienced at about the same time that sweating disappears — research showing this condition to be at an effective temperature of about 78 deg. (*Effective temperature* is an index combining the effects of dry bulb temperature, relative humidity and air motion.)

The higher air volumes and velocities used in evaporative cooling systems also promote comfort, he said. In some areas, air movement alone does about half the cooling job, he stated. No limitation on relative humidity is necessary, he said, if the air is moving freely and people are not sweating.

Difference of opinion on the use of evaporative cooling other than in the Southwest was expressed during the "open for discussion" period. John Everetts, Jr. (of the

(*Continued on page* 44)

On all counts . . .



MODELS JB200HT, JE300HT, TWIN CYLINDER CONDENSING UNITS

air cooled	x
full tonnage	x
full hermetic compressor	x
pre-wired	x
low cost	x
easily installed	x
quiet operation	x
compact design	x
minimum service	x

Tecumseh's NEW 2 and 3 HP Remote Highsides

build year around air conditioning sales

Open up your market for year around air conditioning with remote units that give you all the latest advancements in refrigeration. Air cooled to eliminate water requirements, these units are also designed to operate under extreme conditions, such as 120° ambient or 90% of rated voltage. Equipped with full hermetic compressors which cannot be tampered with, they assure you years of dependable service. Twin fans give more efficient cooling of the condenser surface and lower the height of the unit. The compact size takes up a minimum of space and adapts itself readily to weather proofing. These units deliver full rated tonnage, making it easier to estimate a job properly.

Tecumseh's new remote highsides are prewired at the factory, leaving only the power line, transformer, and the thermostat leads to be wired in the field. Several important safety devices are built into the highside to protect the compressor against field failure of components. A circuit breaker protects against failure of the start capacitor or relay. A high pressure control protects against high head pressure by condenser obstruction or fan motor failure. And a low pressure control protects against low suction pressure caused by a leak or restriction in the system.

The units are shipped dehydrated, charged with oil and sealed against atmosphere. A large oil reserve in the compressor assures adequate lubrication at all times.

Versatile enough for all types of applications, Tecumseh's new remote highsides are designed and built with the experience gained from more than 22,000,000 compressors. Investigate your market potential today and profit by Tecumseh's experience.

The World's Largest Producer of Compressors for the Refrigeration Industry

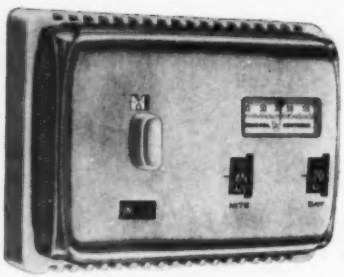
TECUMSEH PRODUCTS CO.

Marion, Ohio
Tecumseh, Michigan
Danville, Illinois

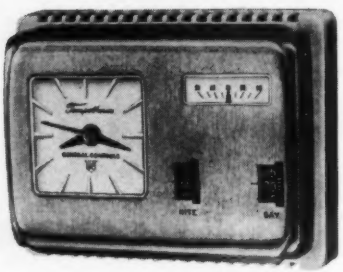
EXPORT DEPT.—P. O. Box 2280, 24530 Michigan Ave., W. Dearborn, Michigan

BEST 15 YEARS AGO.....STILL BEST TODAY!

...Feature General Controls self-powered



T-265 Timer Thermostat—automatically switches from night level to day level after expiration of selected interval which is manually set by spring-type timer.



T-270 Tempotherm—combination clock thermostat switches from day to night temperatures absolutely automatically. Set it—like a clock—and forget it!

T-99 Thermostat—mercury switch design, hermetically sealed contacts. **T-80 Thermostat**—thermopoised contacts, especially sensitive for "straight line" temperature control.

WHY SELF-POWERED CONTROLS ARE GOOD:

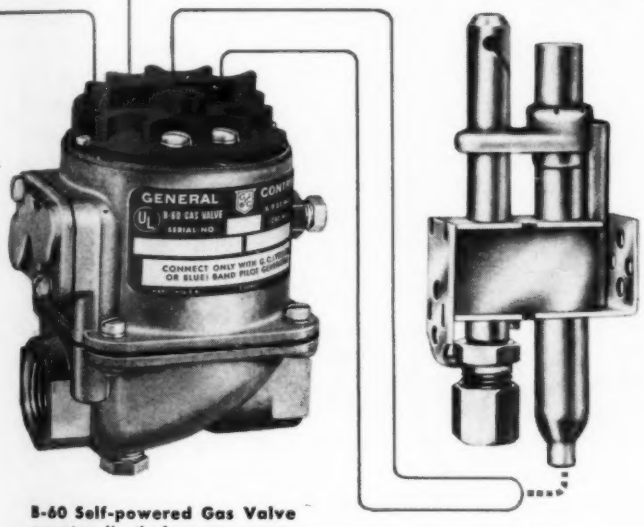
1. **Customers appreciate low cost installation**—and the savings made possible by its design simplicity—two parts, no special wiring, no special mounting.
2. **Customers are completely satisfied with quiet operation**—and you are saved the time-consuming service calls and "headaches" of noise complaints.
3. **Customers have no power-failure problems**—whatever the weather does to regular power lines, this self-contained system goes right on delivering uninterrupted comfort.
4. **Customers save on service calls**—B-60 valve automatically recycles after minimum pilot condition has been corrected. Main line shutoff if pilot should go out.

WHY GENERAL CONTROLS' B-60 SYSTEM IS BETTER!

1. **You know it's best by actual test**—that is guaranteed by 15 years of field performance covering hundreds of thousands of service-free installations.
2. **Your installation problems are gone**—the simplified wiring block is on *top* of the valve. Terminals are always easy to get at. No special wiring or mounting.
3. **You can count on top performance all the time**—with the powerful 700 millivolt generator and stable blue-flame pilot for reliable operation in the roughest installations.
4. **You have no "Lint-plug" worries**—General Controls "Snorkel" design completely eliminates lint interference, makes those difficult "above the floor" jobs truly worry-free.

by feature, point by point...
famous B-60 is the best
gas control system money can buy!

The original...first and still foremost...
B-60 self-powered gas control system



B-60 Self-powered Gas Valve operates silently from power supplied by pilot; provides gas in response to thermostat and automatically shuts off for safety if pilot goes out. Space-saving, multipoised models available.

PG-9 "Snorkel" Pilot Generator—does triple duty: eliminates lint problems, provides blue-flame ignition, and generates 700 millivolt power to operate entire control system.

No outside current required! No power-failure service calls! Quiet operation with accurate temperature control and positive safety! These are the performance features which electrified the heating industry with the introduction of the revolutionary B-60 Control System 15 years ago. And today—proved by hundreds of thousands of trouble-free applications ... the famous General Controls B-60 system with its 700 millivolt pilot generator still fits by far the greatest range of applications—still stands *first and foremost* in the heat control field!

General Controls
self-powered
B-60
System

1930 25 YEARS 1955

1955 SILVER JUBILEE YEAR

General Controls outstanding B-60 control system is custom-matched to the famous line of General Controls room thermostats... distinguished alike for their style and performance... available in mercury, snap-action, and thermopoised designs for accurate, straight-line temperature control. Your best guarantee of customer satisfaction.

GENERAL CONTROLS

MANUFACTURERS OF AUTOMATIC CONTROLS FOR HOME, INDUSTRY AND THE MILITARY

GENERAL CONTROLS • PERFEX CONTROLS

40 FACTORY BRANCH OFFICES SERVING THE UNITED STATES AND CANADA

FIVE PLANTS: IRON MOUNTAIN, MICHIGAN • GLENDALE, CALIFORNIA • BURBANK, CALIFORNIA • SKOKIE, ILLINOIS • GUELPH, CANADA

(Continued from page 40)

office of Charles S. Leopold, consulting engineer, Philadelphia), who was with the Navy's Bureau of Ships during the war, said that 78 deg effective temperature is not a comfortable condition. However, the Navy has used it as a criterion as it prevents sweating and allows men a good night's sleep so "they can fight the ship" the next day.

Economy is a Feature

Mr. Ash felt that, as 78 deg ET prevents sweating, it does represent a condition of comfort. Walter A. Grant, director of research of the Carrier Corp., Syracuse, N. Y., did not feel that evaporative cooling gives indoor comfort unless outside humidities were quite low. He pointed out that, in places where Mr. Ash had stated there is considerable activity in evaporative cooling, air conditioning with mechanical refrigeration is even more popular. Mr. Ash agreed with Mr. Grant for cases where air conditioning can be afforded, but said many people who can't have air conditioning can have evaporative cooling. Another member of the audience said engineers are hesitant to adopt evaporative cooling because of the difficulty in predicting what conditions it can maintain under varying outdoor conditions.

William T. Smith, chief of the refrigeration and air conditioning section of the U. S. Air Force headquarters, Washington, D. C., chairman of the session, summarized the differing viewpoints by saying that evaporative cooling is something of "a compromise between good results and a little relief." The Air Force couldn't afford to air condition all of its barracks, "as it would cost millions," but can provide relief in many places with evaporative methods. Mr. Ash cited the numerous installations of straight mechanical ventilation for comfort, and said many of them offered evaporative cooling possibilities.

Discussing the fundamentals of air cooling by evaporation, S. F. Duncan — director of research of the Farr Co., Los Angeles — defined the saturation or evaporative cooling efficiency as the dry bulb temperature of the air entering the cooler minus the dry bulb of the air leaving the cooler, divided by the dry bulb of the entering minus the wet bulb of the entering air [$E = (DB_1 - DB_2)/(DB_1 - WB_1)$]. A reasonable and easily obtained saturation efficiency is 80 percent, he said.

Because an evaporative cooling system uses only outside air, only the sensible heat load — and not the latent load — is considered in computing a design.

R. J. Peterson, chief engineer of the Utility Appliance Co., Los Angeles, explained many of the engineering fundamentals of evaporation from surfaces.

What Are the Limitations?

Stuart Giles, mechanical engineer with the U. S. Naval Research and Evaluation Laboratory, Port Hueneme, Calif., spoke on weather data limitations of evaporative cooling. He said that — as a preliminary guide — where the outside wet bulb is 70, the application is good, where the wet bulb is 73, the application is fair, and where the wet bulb is 76, it is a fringe area. The air velocity is "the clue to the effectiveness of evaporative cooling" in many instances, however. He showed a map of the U. S. indicating the sales last year of evaporative coolers (about 85 percent of them for residential use). According to the map, the total was 400,000 units in the West and Southwest; 150,000 in the Northwest, Southeast (except Florida and the Gulf Coast), and central part of the country; and 20,000 in the Northeast plus Florida and the Gulf Coast. He stressed that the figures are estimates.

WITH EVAPORATIVE COOLING . . .
. . . the dry bulb temperature of the air is lowered and its humidity is increased. The total heat content of the air remains unchanged, the reduction in sensible heat being accompanied by a corresponding increase in latent heat.

Richard Hukill, also of the Naval Research and Evaluation Laboratory, another member of the panel, classified evaporative cooling systems into two main groups, direct and indirect. The direct systems may be classified further as the drip type, slinger type, air washer type, and rotary type, he said.

He stressed the need for providing for exhaust from the building of the 100 percent outside air used by an evaporative cooling system. He stressed too the necessity for access to the equipment for servicing; otherwise, drip type coolers will scale up and efficiency will drop, he said.

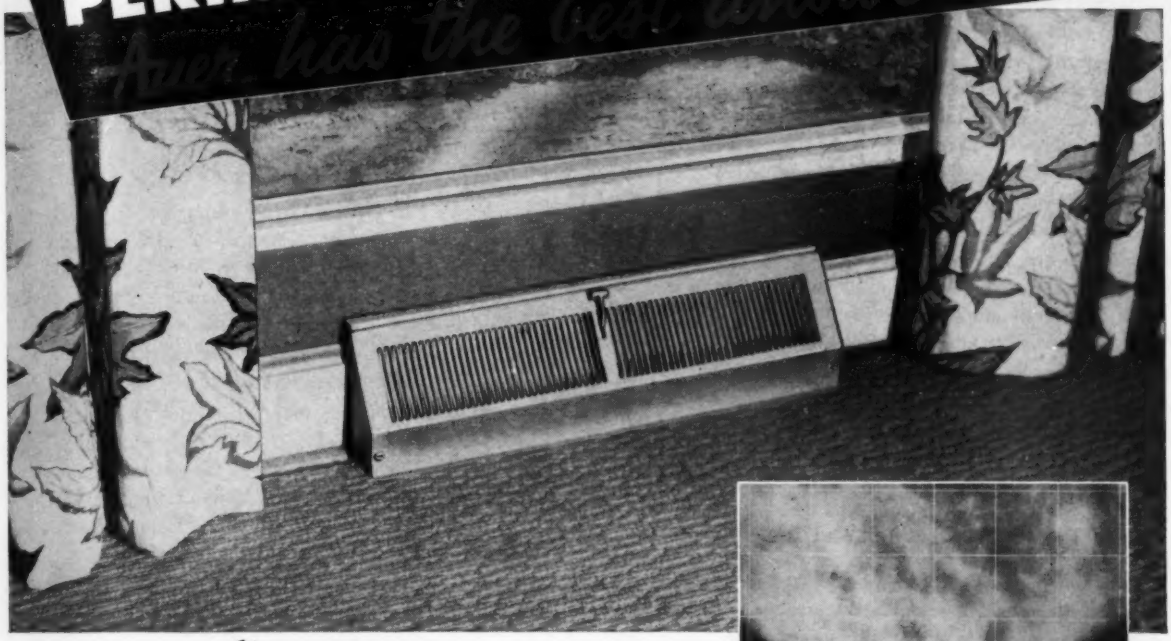
One installation he described has a double duct, with ceiling air diffusers. In winter, warm air is supplied through one duct and introduced through the outer cone of the diffusers, the return air going through the center of the diffusers to the other duct. In summer, evaporatively cooled air is supplied through both ducts, and introduced to the room through all cones of the diffusers. The two-speed fans handle about twice the air quantity in summer as they do in winter.

Indirect Systems Described

Donald T. Robbins, chief engineer of Holmes & Narver, Inc., engineers and constructors, Los Angeles, then described indirect evaporative cooling systems using heat exchangers. There are many types, and numerous variations of these types: simple dry surface systems, indirect-direct (wherein return air is mixed with outside air in about a 60 to 40 percent ratio), multi-stage, regenera-

PERIMETER HEATING?

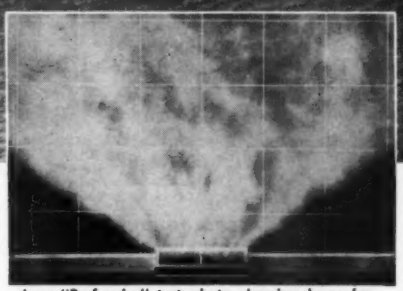
Auer has the best answers



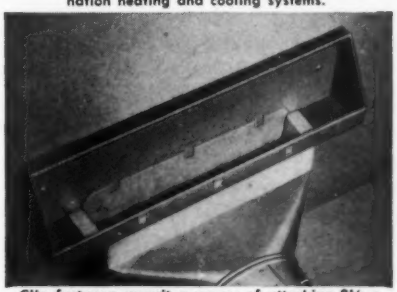
Auer "Perfusaire"
TRADE-MARK

The new *low-cost* baseboard decorator style perimeter diffuser illustrated above is only 18" long, but with a capacity of 4 to 8 foot units. Designed for easy installation in or against plastered walls, inside or outside the baseboard and in new or old construction. It has a pre-cut hole for 2¼ x 12" duct openings and knock-outs to accommodate 2¼ x 14" where needed. It is the answer to uneven wall installations—so difficult with long diffusers.

"Perfusaire" distributes air evenly over a wide fan-shaped area, and is equipped with a built-in damper for system balancing. It is an ideal unit for combination heating and cooling systems.



Auer "Perfusaire" test photo showing huge fan-shaped air pattern, ideal for heating and combination heating and cooling systems.



Clip fasteners permit a means of attaching 2¼ x 12" or 2¼ x 14" duct without cutting the diffuser.

FLOOR TYPE

For floor type perimeter and intricate "narrow-space" installations, Auer can fill your needs from its complete "DRP" line of registers in standard sizes.

(Above) Auer DRP 2¼ x 14" floor perimeter diffuser.

(Below) Auer DRP floor perimeter diffuser (4 and 6" widths, 10, 12 and 14" lengths).

Write for full details on low cost "Perfusaire" and other perimeter diffusers. Ask for Bulletin P-54.

Auer REGISTERS and GRILLES

THE AUER REGISTER COMPANY

6600 CLEMENT AVE. • CLEVELAND 5, OHIO

tive (using cool air returned from the room in a spray chamber), the plate type (a variation of the regenerative), and evaporative cooling combined with mechanical refrigeration (using 100 percent outside air with precooling by evaporation and saving in some cases and under some circumstances 20 to 30 percent of the refrigeration otherwise needed).

Ralph E. Phillips, Jr., consulting engineer, Los Angeles, reviewed some of the history of evaporative cooling. Early applications are the porous water-filled vessels used to make ice in India through the cooling effect of evaporation and radiation of heat to the night sky, the "ice walls" in Iran employing a similar principle, and the wetted grass mats hung in doorways to cool the air when there is a breeze. He classified types of evaporative coolers as the pad type, the air washer type, the exhaust window units (with no fans, air being drawn through them by the house attic fan), and the rotary pad type.

Water Treatment — When and How

The final speaker at the session was Ralph M. Westcott (Holladay & Westcott, Engineers, Los Angeles), whose subject was water treatment for evaporative cooling. Objectives of treatment are to reduce scale buildup, corrosion and organic growths (algae and slime). Bleeding off some of the water regularly together with cleaning of the equipment is the best answer, he said; then, if the system is large enough, water treatment may be justified.

He said the polyphosphates are accepted as good water treating chemicals, especially for inhibiting scale. Equipment should be well-coated during its manufacture to protect against corrosion. Possible toxic effects and/or odors must be considered when choosing chemicals for water treatment.

He warned against "magic" water treatment devices which, installed in the return line, are claimed to do the complete job with no further attention. None that he knows of has stood the test of time, he said.

In a supplementary comment requested by Chairman Smith, James Marshall — of the Minneapolis-Honeywell Regulator Co., Sacramento, Calif. — said the usual method of controlling an evaporative cooling system is a cooling thermostat to put the equipment in operation as the temperature rises, with a humidistat to act as a limit control.

Blower Manufacturers Elect Officers

F. W. BRUNDAGE was elected president of the Air Conditioning Blower Manufacturers' Association at the group's recent meeting held in Chicago's Drake hotel. Thompson Morrison was elected vice president, and W. W. Morrisey became secretary-treasurer.

Coming Events

Sept. 27—Chicago Warm Air Golf Association, golf meet. Ruth Lake Country Club. Melvin A. Jackson, President, c/o Wolverine Tube Div., Calumet & Hecla, Inc., 1580 Sherman Ave., Suite 406, Evanston, Ill.

Nov. 1-5—World Symposium on Applied Solar Energy, Westward Ho Hotel, Phoenix, Ariz. Sponsored by the Association for Applied Solar Energy, Stanford Research Institute and the University of Arizona. Lewis W. Douglas, Chairman, Suite 204 Mayer-Heard Bldg., Phoenix.

Nov. 27-29—National Heating & Airconditioning Wholesalers, Inc., fall annual meeting and convention. Hotel Governor Clinton, New York. Wilbur R. Bull, Executive Director, 1200 W. Fifth Ave., Columbus, O.

Nov. 28-Dec. 1—Air-Conditioning and Refrigeration Institute, 9th Exposition of the Air-Conditioning and Refrigeration Industry. Atlantic City, N. J. George E. Mills, show director, 9th Exposition of the Air-Conditioning and Refrigeration Industry, 1346 Connecticut Ave., N. W., Washington, D. C.

Nov. 28-29—National Warm Air Heating and Air Conditioning Association, board and committee meetings. Hotel Statler, New York. George Boeddener, Managing Director, 640 Engineers Bldg., Cleveland 14.

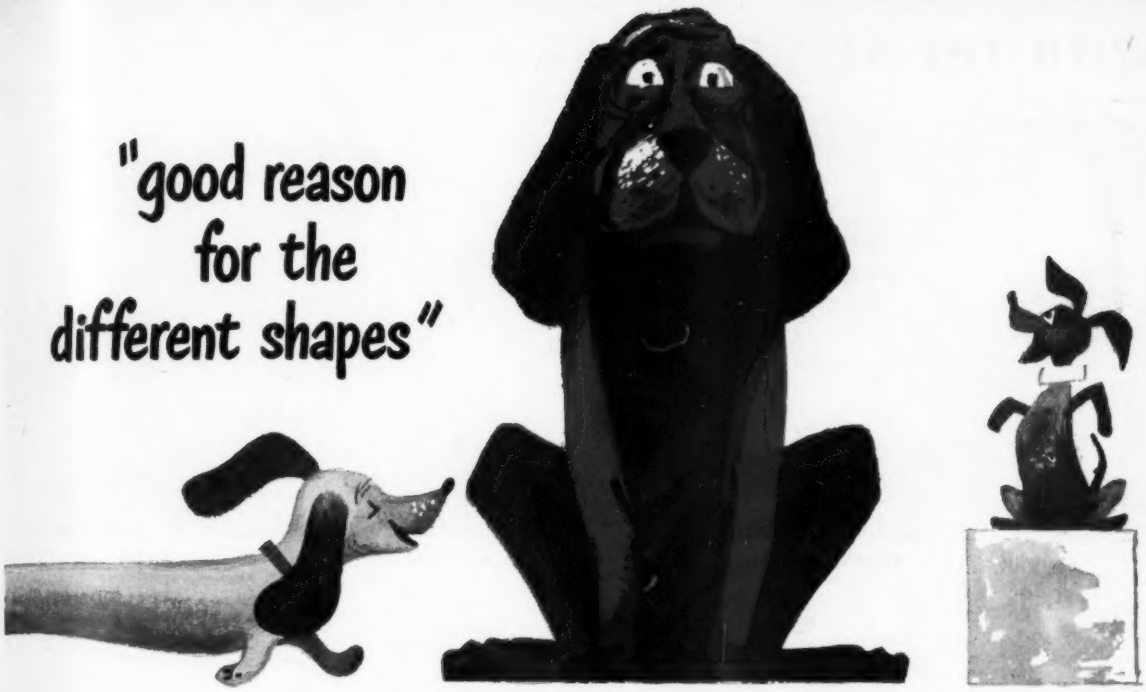
Nov. 30-Dec. 1—National Warm Air Heating and Air Conditioning Association, annual convention. Hotel Statler, New York. George Boeddener, Managing Director, 640 Engineers Bldg., Cleveland 14.

Dec. 1-3—American Society of Refrigerating Engineers, annual meeting. Traymore Hotel, Atlantic City, N. J. R. C. Cross, Executive Secretary, 234 Fifth Ave., New York 1.

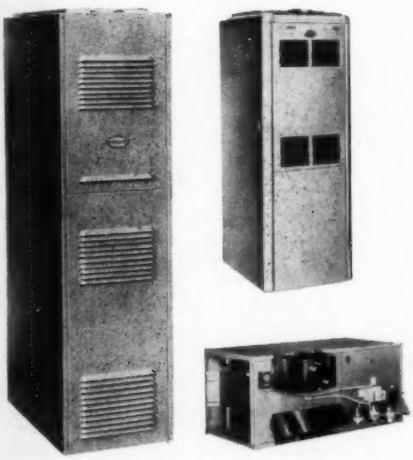
Jan. 23-25—American Society of Heating and Air-Conditioning Engineers, Inc., annual meeting. Sheraton-Gibson Hotel, Cincinnati. A. V. Hutchinson, Executive Secretary, 62 Worth St., New York 13.

May 9-12—Sheet Metal Contractors' National Association, Inc., annual convention. Shoreham Hotel, Washington, D. C. J. D. Wilder, Executive Secretary, 170 Division St., Elgin, Ill.

"good reason for the different shapes"



UTILITY'S HORIZONTAL AND VERTICAL FURNACES



No matter where, no matter why, there's a specially-designed Utility forced-air furnace to fit the job. Utility's engineers have created units that operate just as effectively in horizontal or vertical positions.

For space-saving efficiency, where quality counts, Utility's vertical furnace takes honors. In capacities of 70, 85, 100, 135, 165 and 200,000 BTU, it can be installed in closet, alcove or service porch.

Where there's seemingly no room at all, any nook or cranny will do for Utility's horizontal furnace. It works equally well from a spot in the attic, under the floor, under the staircase or even suspended from the ceiling. This is the one you choose when a remodeling job or new home has utilized every bit of floor space for living.

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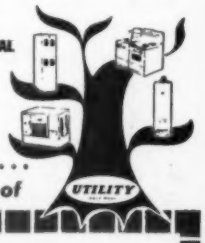

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(Continued)

MID-YEAR committee members are (*left to right*) Don McCloskey, Z. V. Hazelton, Ben Flock, Merle Dailey, Woodruff Goodyear

AN AFTER-THE-MEETING session with the speakers. Above (*left to right*) are Frank Anderson, John DiMatteo, H. O. Berg, William E. Garber, Jr.

Sell "Budget Selling"

. . . and make money, Indiana contractors advised at mid-year district meeting

REMOVE THE TARNISH from the term "time payments" when discussing the financing of a warm air heating or residential air conditioning system with prospects was the advice given the 125 Indiana sheet metal and warm air heating contractors gathered last month in Gary for the association's mid-year district meeting. The man presenting a proven approach to more sales was John DiMatteo, Chicago manager, First Bancredit Corp., who has more than 20 years' experience in meeting the public under the usually strained situation where financing the cost of a needed or desired piece of merchandise is being discussed.

Experience has shown, Mr. DiMatteo says, that the term "Budget Buying" is the easiest approach to helping the prospect to see his way clear to making the purchase. He pointed out that quoting a monthly payment figure without ever mentioning the total amount of the purchase gives the customer a chance to quickly calculate his ability to meet the monthly cost. Very seldom, he says, will a customer be interested in how long the payments will continue — it's the monthly cost that concerns him most.

Budget selling becomes a tool whereby the warm air heating dealer is able to quote a price that not only gives him a fair profit but permits him to sell other accessories such as humidifiers, electronic precipitators, complete control systems and other extra equipment that adds up to a higher grade installation. Mr. DiMatteo said the national average budget sale runs 70 percent higher than the average cash job.

One of the figures quoted to show that budget selling reaches all classes of prospects was the number of Cadillac automobiles sold on the budget plan — over 30 percent are marketed this way. The total consumer credit outstanding is now almost 30 million dollars, Mr. DiMatteo said, and concluded with a reminder that budget selling results in selling a better job, easier and quicker.

Reduction in Contractors' Tax

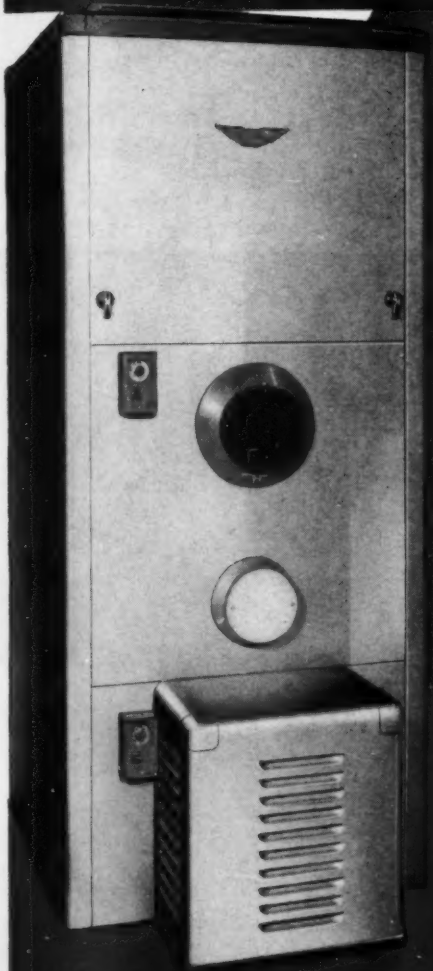
Since 1933 the Gross Income Tax Law of Indiana has been responsible for an added financial burden on the sheet metal contractors and warm air heating dealers. The interpretation of the law by the Indiana Gross Income Tax division resulted in what dealers and contractors considered was an unfair assessment upon their profession. The steps to correct this situation were outlined by William E. Garber, Jr., Indianapolis warm air heating dealer and recent president of the Building Congress of Indiana, Inc., who has worked untiringly to obtain legislative recognition.

This group's activities have now brought about a change in the old law, and beginning July 1, 1955 con-

(*Continued on page* 52)

...a counter-flo for the BIG JOBS!

DOES THE JOBS USUALLY REQUIRING 2 SMALLER FURNACES



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This husky addition to the VICTOR line fully meets the increasing demand for a powerful COUNTER-FLO, big enough for today's modern slab or ranch type homes. You'll find few, if any, like it! They are VICTOR fin constructed, with heat exchangers of special alloy steel, WARRANTED FOR 15 YEARS! They're available NOW.

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GENTLEMEN: Please send me without obligation complete literature and details about your VICTOR Series "D" Counter-flo line for gas and oil.

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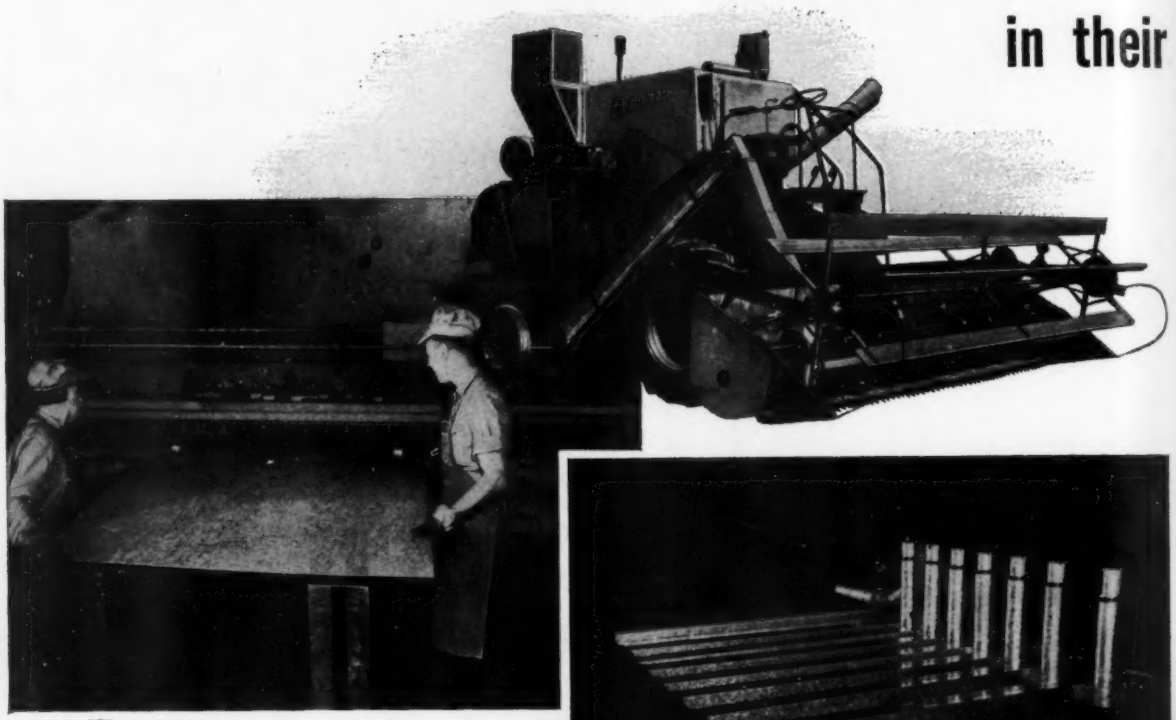
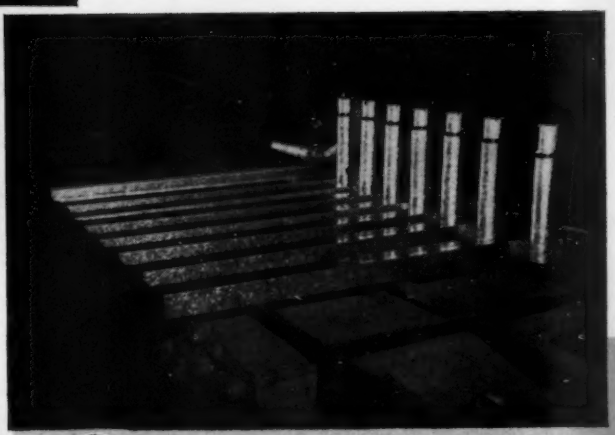
Leading Implement Manufacturer utilizes the quality features of in their



An early processing step demonstrates the die punching of assembly holes in the USS Galvanized Steel Sheet that will later become grain bin bottom.



Another operation shows the assembly of grain bin elevators. The formed sheets are soldered to make them grain tight, then riveted for strength.

Here the rigid frame is riveted to the grain bin.

SEE "THE UNITED STATES STEEL HOUR"— Televised alternate weeks—Consult your newspaper for time and station.

USS Galvanized Steel Sheets

Gleaner Baldwin Combine

The 1955 Allis-Chalmers line of well-known Gleaner Baldwin Self-Propelled Combines is an outstanding example of the use of USS Galvanized Sheets to assure a quality product.

Allis-Chalmers explains in their advertising literature why they use Galvanized Steel Sheets:

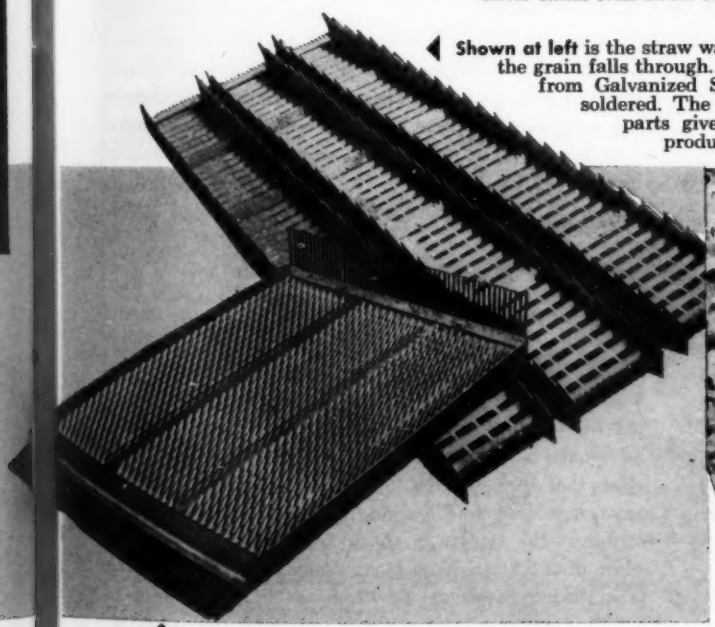
"Galvanized sheet steel is used throughout the Gleaner Baldwin. These corrosion-proof sheets which require no painting give you the protection needed for the life of the combine. After many years of exposure galvanized sheets will not rust or deteriorate materially. The grain bin, the separator, the shoe and the elevators are made of galvanized sheet steel. This extra quality is part of the premium you get with a Gleaner Baldwin."

In addition to their long-wearing properties, USS Galvanized Steel Sheets have other advantages. They allow Allis-Chalmers to offer the farmer a good-looking combine that will stay that way without any painting or special maintenance — an important sales point.

Another outstanding quality of USS Galvanized Steel Sheets is their workability. In the pictures some examples are given of the many shearing, blanking, punching, notching, cutting, forming, stamping, bending, twisting, drawing, beading, seaming, riveting, welding, screwing, and soldering steps to which these sheets are subjected. The fact that USS Galvanized Steel Sheets stand up under these severe fabricating operations, without failure or flaking, is proof of their superior workability, ductility and uniform quality.

If there's a place in *your* operation where the top-quality of USS Galvanized Steel Sheets will pay off, ask your sheet distributor or our nearest district sales office or write for more information to United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



Shown at left is the straw walker, which moves the straw up the incline while the grain falls through. All these intricate parts are stamped and formed from Galvanized Steel Sheets, then screwed, riveted, welded and soldered. The straw walker takes a real beating. All of these parts give the best service when formed from a quality product like USS Galvanized Steel Sheets.

Shown above is the chaffer, the heart of the combine, where the grain is separated from the chaff. All these moving, vibrating teeth are made from USS Galvanized Steel Sheets. For this application, the galvanized steel must not only be uniformly ductile and non-flaking, but must also be absolutely non-rusting.

USS

USS GALVANIZED STEEL SHEETS

UNITED STATES STEEL

WITH THE ASSOCIATIONS

(*Continued from page 48*)

tractors are required to pay less tax on their incomes. The new method of computing the tax to be paid on a $1000 furnace installation is:

Breakdown of costs:	
Furnace selling price	$800
Installation labor costs	200
Tax rate application:	
$800 at ½ percent	$4.00
$200 at 1 percent	2.00
Total tax	$6.00

Contractors and dealers are also eligible for a refund on gross income taxes paid during the past three years if they contact the local office of the Gross Income Tax Division and complete the forms required. The new rate for computing the tax is to be used when requesting the refund, Mr. Garber said.

Don't Forget Business Integrity

The fast pace at which a businessman must go to keep up with his competitors in today's market often causes some to wish that they could return to the environment accompanying business conditions of 15 or 20 years ago, said Joseph D. Wilder, executive secretary, Sheet Metal Contractors' National Association. The pressure of keeping business appointments for lunch and dinner day after day limits the modern businessman's time to attend to the other essential duties of running his business. The appointments, many of which are connected with civic duties, are a part of the business pattern followed today, and it is important to obtain public recognition to build a dealer's reputation.

All too often, however, the pressure of civic duties causes a dealer to forget or postpone the handling of promises he has given customers. This failure to keep a promise is hurting the business reputation as much as all of the good he is doing by the attention given to public affairs. Build your business based upon integrity, keep your promises even if it means staying on the job a little longer, don't sacrifice responsibility, and build your reputation for being truthful in all dealings, if you want to maintain your business volume when there is less total business to be done in your particular area, Mr. Wilder advised.

Michigan Group Holds Ladies' Night

THE MACOMB COUNTY (Michigan) Heating Association held its annual ladies' night party at the Hof Brau hall in Fraser. More than 200 persons were present for the banquet and the entertainment which followed. Toastmaster for the evening was Tex Richard, and Fred Bumler led the singing.

Proof that a summer outdoor meeting can draw good attendance was evidenced by the fact that 30 members turned up for the July gathering at Stan Prevost's dugout. Tex Richard gave a report on the business management conference which he attended in Lansing. Following the meeting, Mr. Prevost served steak sandwiches cooked on his outdoor grill.

DR. WILLIAM F. RAASCHE, director of the Milwaukee Vocational School, presents Civic Apprenticeship Award to Angelo Hoffmann

Wins Award for Apprentice Training

ANGELO HOFFMANN, past president of the Sheet Metal Contractors' National Association and also of the Sheet Metal Contractors Association of Milwaukee, recently received a Civic Apprenticeship Award in recognition of his many contributions to the cause of good apprenticeship training. The presentation was made at a graduation dinner held for apprentices in all trades who successfully completed courses at the Milwaukee Vocational School.

5400 Models Tested by AGA in '54

THE AMERICAN Gas Association reports that the laboratories in Cleveland and Los Angeles last year tested a record number of 5400 models of gas fired equipment. The seal of approval awarded to units successfully passing the tests is displayed on over 95 percent of all gas equipment sold today, according to the association. AGA states that appliance testing operations were so numerous that extra shifts were put on, and during the summer the staff was the largest in the history of the laboratories. More than 800 field and factory calls were made by AGA laboratories' inspectors to examine equipment prior to granting or renewing certification. Central heating equipment accounted for about 40 percent of the new models tested.

The laboratories' expansion program at Cleveland was marked by the completion of a 17,800 sq ft north wing building which provides 23 additional testing stations for testing central heating equipment and domestic incinerators. New executive and administrative offices in a south wing were also completed.

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Make no mistake about it . . . no matter how small your filter requirements . . . or how large, here is a completely new air filter development that can absolutely cut your clean air maintenance costs in half.

NO HEAVY TENSION OIL — Evans filters do not have a messy, sticky type of adhesive that is filthy to handle and difficult to clean. It is unnecessary and is forbidden in the use of Evans filters.

CLEAN WITH TAP WATER — Evans filters can be cleaned clean in minutes with nothing ever but tap water sprayed through an ordinary garden hose nozzle. They require no expensive fireproof room. No caustic cleaning solutions or agents. This eliminates all danger in the cleaning of Evans filters.

LIGHT WEIGHT CUT LABOR COSTS — Evans filters are all aluminum. Light to handle, to carry, to pick up. In spite of airtight fitting frames, Evans filters pull quickly and easily in and out of the frames. Take much less effort, less labor to handle. No latches . . . or lugs required.

REMEMBER: Initial costs for air cleaning equipment are not the big factors or controlling factors in the cost for clean air.

IT'S OPERATING COSTS THAT YOU MUST LIVE WITH AND THAT YOU MUST CONTROL.

EVANS FILTERS GIVE YOU THAT CONTROL. MAKE IT POSSIBLE FOR YOU TO SAVE 50% ON CLEAN AIR MAINTENANCE COSTS.

- ALL ALUMINUM
- EVERY PART PRECISION MADE
- HOLD UP TO 200% MORE DUST AND LINT WITHOUT HARMFUL RESTRICTION TO AIRFLOW
- GIVES LIFETIME SERVICE

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Gentlemen: I wish to know how to cut my clean air maintenance costs in half with a filter that gives lifetime service. Please send me new illustrated catalog.

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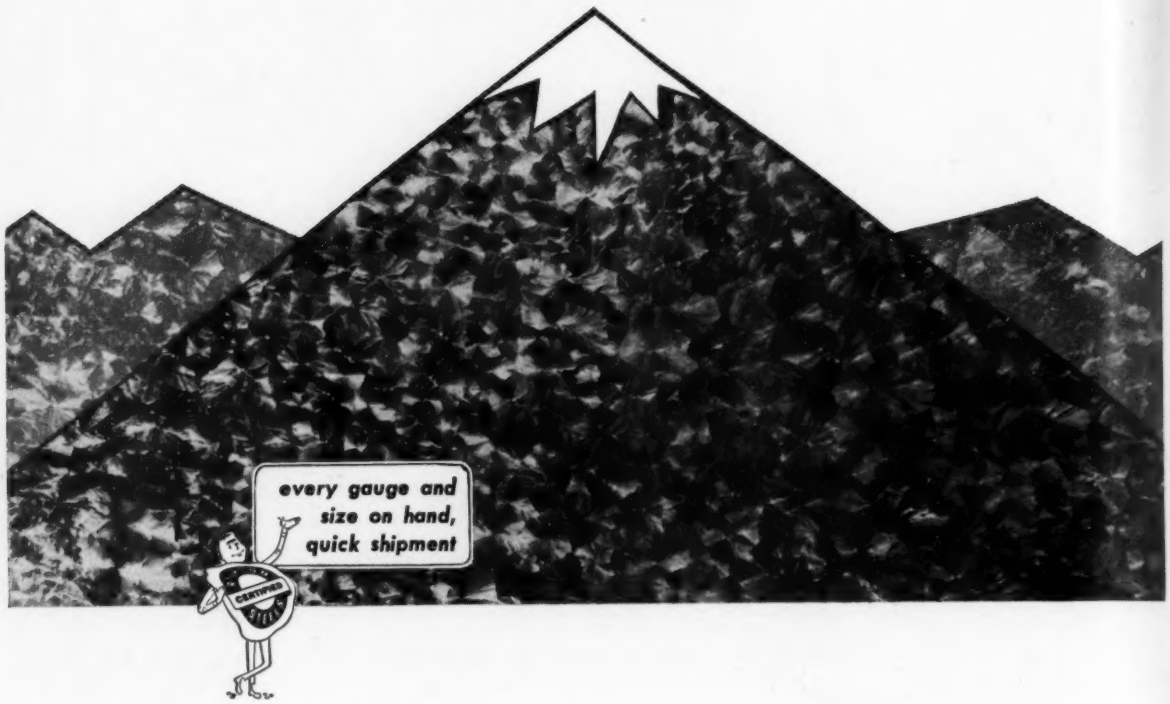
peak stocks of galvanized



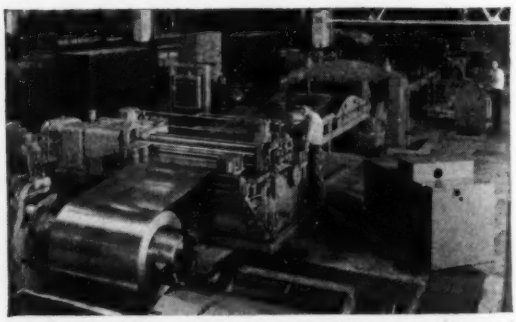
. . . here's how they increase your profits

Sheet metal shops profit three ways when they draw on Ryerson stocks of high quality galvanized.

First, because Ryerson carries peak stocks of galvanized—hundreds of tons in every gauge and size—shops save on the cost of maintaining inventories of their own. Second, because Ryerson has all the equipment for quick quantity cutting, they can reduce scrap loss by ordering the exact sizes needed on the job.

Third, and perhaps most important, Ryerson galvanized sheets are bright, ductile, true-to-gauge—with a tight, uniform coating. So shops can turn out the kind of work that keeps regular customers and wins new ones.

In addition, you can save time and trouble by taking care of all your steel requirements with one order to Ryerson. Awaiting your call are bars, bands, angles, tubing, etc., black and galvanized, as well as more than 20 different kinds of sheet steel. So next time you need steel quickly, try this dependable cost-cutting service.



The latest in cut-to-length lines at Ryerson quickly convert galvanized coil stock into flat sheets of any measure.

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Are Atomic Heating Systems Feasible?

OF LATE there's been some talk of an atomic heating system for the home. Let's admit that such a system is no doubt technically feasible. After all, waste heat from large atomic reactors is already in use for heating buildings, and the submarine Nautilus operates on atomic energy.

But it's going to take a lot more than wishful thinking to bring about a practical solution to the multitude of problems involved in using the process for home heating.

Low cost atomic home heating ready for use in a few years — as predicted by some — seems highly improbable, in our opinion. Utility experience in development of atomic central station plants doesn't indicate that savings are to be expected, at least for awhile yet. However, scientific developments are so rapid these days that we must rely on those with special knowledge for information on which to base our opinions.

On the subject of atomic energy there are few people with more knowledge of the problems to be faced than Rear Admiral Lewis L. Strauss, chairman of the Atomic Energy commission, who said in a recent statement, "Ultimately, atomic energy will heat and light our homes, propel our ships and planes, and give us healthier lives with more comfort and leisure. However, I doubt that we can expect that homes throughout the United States will be heated by atomic energy within the lifetime of the present generation.

"In order to replace the conventional fuels now used for heating, such as coal, oil and natural gas, nuclear power must first become competitive with such fuels."

The dream of heating homes with atomic energy thus is not likely to be realized within the next five or six years, despite predictions to the contrary being made in certain quarters. Some imaginative speculators are even talking costs for such a heating system, although sufficient information about costs, both erection and operating, hasn't yet been accumulated on the most feasible use of atomic energy — the generation of electrical power. To again quote Admiral Strauss, "Steady progress is being made toward reducing the cost of electricity produced from atomic reactors, but as yet it cannot be generated on a dollars-and-cents basis that is competitive for lighting and heating homes and running our industries."

Another statement being made by promulgators of a proposed home atomic heating system — and maybe it's a good selling tool — is that heating systems using that method of heating can be readily converted when the so-called "A-System" becomes available. The answer to this one would seem to be, "How many of the heating systems being designed today will be in use after this generation has passed on?" Certainly, we can't stand still and wait for nuclear power to come along to do the home heating job.

An air circulation system provides even temperatures both winter and summer, ventilation, humidity control the year around, and clean air for American homes. The warm air heating and residential air conditioning industry will develop even better systems than we have today — whether the fuel be gas, oil, coal or (some day) atomic energy.

"MOST AIR CONDITIONED city," Houston has a vast outlying residential area — a fertile air conditioning market

An Artisan REPORT TO THE INDUSTRY

Who Buys — and Who Sells — Residential Air Conditioning?

RESIDENTIAL air conditioning is booming in Houston — as it is elsewhere. Installations of complete central cooling systems in homes, and of individual window units, too, have shown a steady growth year by year since the end of World War II, with a particularly rapid rise beginning in 1950 and continuing this year.

The dealer-contractors installing the central home air conditioning systems in the Houston metropolitan area report to the Artisan greatly increased activity in 1955 as compared with last year. Individual estimates of the number of jobs they will put in this year range up to 200 percent more than in 1954. Their estimates are based on the work actually done or underway during the first half of this year — and, of course, the "air conditioning season" starts early in Houston.

To all of them, future prospects seem bright. Despite past and present residential air conditioning activity in Houston, their feeling is "it's just beginning to grow," or that "the surface has hardly been scratched."

Last year, the number of central residential cooling jobs increased in number about 30 percent over 1953. The increase in 1953 over 1952 was somewhat over 35 percent. The opinions of dealer-contractors doing the work (as expressed to the Artisan), the record for previous years, and the "snowballing" effect (the more people that are exposed to air conditioning, the more there are that want it in their own homes) would

seem to make the utility company's estimate of a 30 percent increase this year over last quite conservative. But even this conservative increase would mean nearly 1600 central residential air conditioning installations in Houston this year, as compared to the 1213 jobs in 1954.

Why 'Survey' Houston?

Houston is "the world's most air conditioned city," a city of cooling towers, home of the air conditioned Cadillac (and Buick, too), where the un-air conditioned automobile often has venetian blinds to keep out sun heat, where the average capacity of a home air conditioning system is 5 tons, and the average size of a window unit is pretty close to 1 hp.

Houston is in Texas, too (in case you didn't know it), where they're mighty proud of many things — even including extremes in climate. And of the air conditioning that makes their homes and buildings comfortable and healthful.

There's no getting around the fact that the warm and humid summer weather that Houston "enjoys" has much to do with the popularity of air conditioning. And that weather starts early in the year and lasts a long time into the fall. Thus, the real push on sales and installations of home air conditioning equipment starts earlier each year in Texas than it does in many other parts of the U.S.

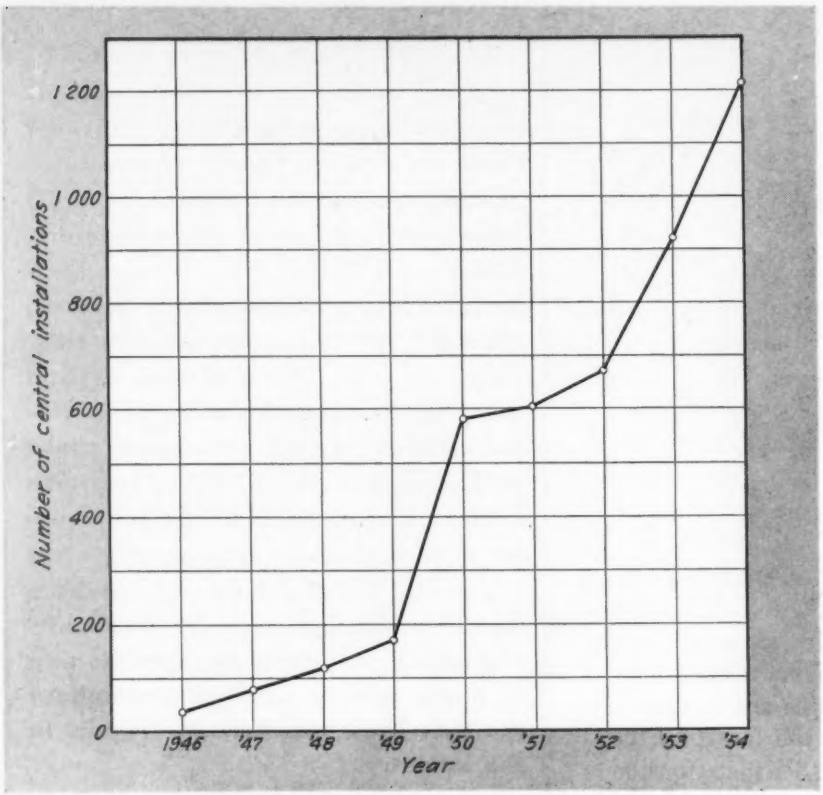
But air conditioning isn't "essential" to life in Houston. Less than 10 years ago there were but few installations (especially in homes) as compared to those today. Even today, the great majority of Houstonians live without air conditioning — for example, the utility estimates that only about 20 percent of the homes have *some* sort of cooling, either a complete central system or at least one window unit. And of the 337,000 individual residential electric meters in the Houston metropolitan area (a radius of 40 to 50 miles) there were but 4502 central home air conditioning installations (only about 1 1/3 percent of the homes) at the end of 1954, according to the Houston Lighting and Power Co. Thus, even in "the world's most air conditioned city" the residential market has just been scratched. Also, even in a climate as warm and humid as Houston's, air conditioning can't be called essential to normal life.

BACKGROUND OF THIS REPORT

What makes up the booming central home air conditioning market? New houses or old? What price range? Where do window units fit in? How does residential air conditioning affect the utilities? Who are the dealer-contractors handling this growing market? What problems do they face? . . . . . The American Artisan went to "the world's most air conditioned city" for the answers to these and other questions. While Houston's climate and location affect the overall picture to some extent, what has happened there should at least be a good indication of developments elsewhere as home air conditioning is more widely applied throughout the U.S. Thus, this Artisan "report to the industry."

The rapid growth in Houston of home air conditioning in recent years, and the bright prospects for its future, do not, therefore, rest only on the climate or on the well known Texas desire to be "firstest with the mostest." What the severe summer weather and the Texas spirit of progress do mean is that the application of residential air conditioning in Houston is perhaps five years (maybe a little more, quite possibly somewhat less) ahead of that in more northern cities.

Because the fundamental reasons for air conditioning homes or any other type of building are just as valid in any city as they are in Houston — although the climate has made them more widely and more quickly aparent — and because there is more air conditioning capacity per person in Houston than elsewhere, the Artisan went there to study home air conditioning practices, trends and patterns. What has happened and is happening in home air conditioning in Houston should help us (with certain exceptions) to picture what is happening and will happen in other U.S. cities and towns.



SALES OF CENTRAL residential air conditioning in Houston

Who buys home air conditioning?

ONE QUESTION that can be answered by the Artisan's study of home air conditioning in Houston, and which applies to any other city or suburban area equally as well, is: Who buys central home cooling?

The trend is a definitely broadening market to the lower priced, smaller home. Houston is said to be one of the few cities in the world that builds $100,000 homes speculatively. Certainly, the homes in this price class, in Houston and elsewhere, are air conditioned. But what about the homes in more representative (even in Texas) price classes?

The dealer-contractors who sell and install central home air conditioning in Houston report to the Artisan that each year air conditioning spreads to the home of lower and lower cost. A year or two ago, air conditioning was a "must" for any house in the $25,000 or $20,000 price bracket, they tell us. Today, the most common figure quoted as the low level price bracket home that must have central air conditioning is $15,000 — with at least one dealer citing the $11,800 home. Two dealer-contractors told us of a speculative builder who, having trouble selling his $15,000 homes without air conditioning, said he was planning to install air conditioning in order to sell them.

Another source reported that "all new $20,000 homes must have central air conditioning, and many of the homes in the $12,000 to $16,000 price class" are built with central cooling. A distributor placed the figure as "the $16,000 house and up." Another put the price range as the $17,000 to $17,500 home, whereas a year or two ago he would have said $20,000 to $25,000. Another said the $20,000 home had been "in the lead, with the $15,000 home coming" as the low price level for the type of house in which central air conditioning is expected as a standard feature.

One of our sources expressed the belief that in five years the Houston home without air conditioning "will be obsolete."

While the figures vary in some cases, our sources of information were 100 percent agreed

that, whatever the lower price range may be, central air conditioning as a "must" facility continues to spread to the lower and lower cost house. This should also be true in more northern cities, although the lower price range figure would perhaps be higher. Difficulty in providing central air conditioning for the new $10,000 house in Houston was indicated, because with FHA or VA financing, the rules on the buyer's income and his monthly payments may not permit approval of the owning and operating cost for air conditioning. (It would seem, however, that this situation might be corrected in time as more data becomes available on the construction economies and other cost savings that home air conditioning often permits.)

The average capacity of the central air conditioning system in Houston homes is high. This figure, too, is coming down, according to those the Artisan interviewed. There are two — perhaps three — reasons. Of course, one is the spread of air conditioning to the lower cost — and therefore smaller — home. Another is the changes in construction — more insulation, better orientation, etc. to reduce heat gains — of homes to conserve on cooling loads. A possible third reason is the use of smaller refrigeration compressors to run more hours per day, with the objective of providing better humidity control in Houston's humid climate. Something of "a trend to 2 and 3 ton installations" is credited by some to this factor.

Many of the dealer-contractors interviewed by the Artisan said that what might have been a 10 ton job a year or two ago would now be a 7½, the 7½ had become a 5, the 5 a 3, and so on. This opinion is due, it is believed, to all of the above reasons rather than to any one of them.

The utility's figures on the number and tonnage by years of all central home air conditioning installations indicate this well-defined trend to smaller capacities. The average tonnage for all installations made through 1954 was 5.03. However, the average for the 1952 installations was 4.95, for the 1953 jobs it was 4.86, and for last year it was 4.77 tons. Of course, these average figures would be smaller in cities with less severe summer climates — but again, the same trend toward installations of less capacity should hold true elsewhere.

1 CENTRAL RESIDENTIAL air conditioning installations show progressive gains (Totals include the installations prior to 1946)

Year	No. of Installations	Tons
1946	35	206
1947	72	420
1948	119	693
1949	168	976
1950	583	2,914
1951	606	3,075
1952	672	3,330
1953	921	4,482
1954	1213	5,787
TOTAL	4502	22,654

2 CENTRAL RESIDENTIAL air conditioning installations by months for 1954

Month	Number of Installations
January	29
February	40
March	96
April	130
May	110
June	183
July	136
August	117
September	115
October	78
November	111
December	68
TOTAL	1213

3 FIVE TON central residential air conditioning installations account for about half the total during 1954

Size in Tons	Number of Installations
2	24
3	369
4	2
4½	2
5	672
6	16
6½	1
7	2
7½	50
8	32
9	1
10	28
12	1
13½	1
14	2
15	8
20	1
25	1
TOTAL	1213

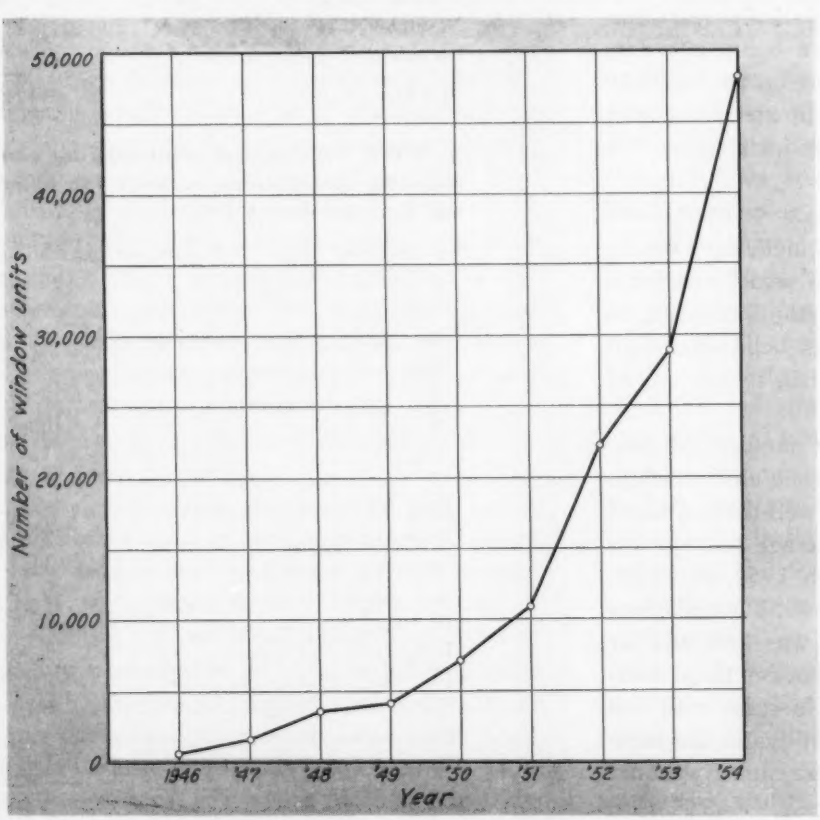
For the sake of accuracy, it should be mentioned that the utility figures quoted herein do not include *all* of the 2 ton residential jobs, although some of them — perhaps one-third — are included. This is because the homes using the smaller central systems in many cases already have adequate electric service for them, and the utility doesn't therefore have as good a check on their total number as it does for the bigger installations.

New Homes or Old Homes?

The proportion of central air conditioning systems installed in new homes as compared to old homes is another question, the answer to which — on the basis of Houston's experience — should also apply in cities with different climates. It would no doubt be affected, however, by the relative proportion of new construction to existing houses, and by the number of existing warm air heated homes with ducts which can be used for cool air distribution as well. (A complete analysis of residential air conditioning potentials by states which allows for the effect of the types of heating systems in existing homes was published in the December 1954 American Artisan, under the title *Where Will Residential Air Conditioning Be Sold?*)

Most of the dealer-contractors in Houston interviewed by the Artisan told us they installed more air conditioning in new homes than in old ones. Organizations tending to specialize in new work also find air conditioning volume in installations for home owners whose heating systems they had put in. While the individual figures varied — and while some of the dealer-contractors interviewed specialize in old house rather than in new house work — if we were to give an over-all or "average" proportion, we'd say it was 65 percent new homes and 35 percent old, or perhaps 60 percent new and 40 percent old. However, some of the figures given us ran to as high as 90 percent new and 10 percent old.

Without worrying too much here about the actual proportion of new homes to old homes, it would seem logical that now, as the central residential air conditioning boom is just getting under way, more installations are going into



SALES OF INDIVIDUAL window air conditioners in Houston

4 WINDOW AIR CONDITIONER sales in Houston have increased strikingly each year during the postwar period

Year	Number of Units Sold	Capacity in Tons
1946	566	424.50
1947	1,689	1,266.75
1948	3,578	2,683.50
1949	4,093	3,069.75
1950	7,269	5,244.00
1951	11,984	8,743.00
1952	22,237	16,293.00
1953	28,953	24,505.25
1954	48,188	45,279.25
TOTAL	128,557	107,509.00

5 ONE TON WINDOW UNITS are by far the most popular size in Houston, accounting for about two-thirds of the 1954 sales statistics

Size of Unit	Number Sold
½ ton & lower	993
¾ ton	12,767
1 ton	32,482
1½ ton	1,559
Consoles (¾, 1 & 1½ tons)	387
TOTAL	48,188

new construction in Houston, and no doubt in many other localities as well. After all, a new home generally does include more modern features than does a comparable existing one. Too, the buyer is perhaps — very generally speaking — in more of a mood for the "up-to-date" and may even be in better position (at least mentally) to take on the necessary financial commitment.

On the other hand, both in Houston and elsewhere, the picture is undoubtedly changing right now, and perhaps the change will come very quickly. Every new air conditioned home makes every un-air conditioned home just a little more obsolete. Every visitor to an air-conditioned home, every neighbor, realizes it's a feature he and his family could enjoy and benefit by. And the millions of existing warm air heated homes, with ducts already installed — as well as many of the homes heated by other methods, or with no central heating at all — form a vast potential for air conditioning which represents a tremendous market.

One prominent manufacturer of air conditioning equipment said recently that central home cooling is split about 50-50 between new and existing construction. Others have said that more installations have been made in existing homes than in new ones. This may well be true now, the Houston figures notwithstanding. If it isn't true now, it may well be next year. Certainly, the millions of existing homes represent a vast air conditioning potential. The proportion of future air conditioning installations in old homes as compared with new depends on many factors — including the volume of new home construction, its quality, the sales and promotion efforts of manufacturers, and the sales and promotion activities of the dealer-contractors who have designed, selected the equipment and installed it in the millions of existing warm air heated homes — and who are doing so for the hundreds of thousands of new warm air heated homes the U.S. is building each year.

Units Lead To Central Jobs

The dealer-contractors installing central residential air conditioning systems in Houston report to the Artisan, in general, that window air conditioning units often lead to the complete central job serving the entire house. That is to say, in more cases than not a central cooling installation for an existing home replaces one or more window cooling units already in use there.

This seems quite logical for full appreciation of home air conditioning perhaps comes only from living with it — or at least a "taste" of it. The cool master bedroom naturaly promotes the desire to cool the other bedrooms, the living room, the TV room, etc. The convenience and cost of the complete central system — especially if the house is heated by warm air, with ductwork already available that can be used for conditioned air distribution — naturally lead to its choice over a number of indi-

vidual window units in the home.

The record shows that there's nothing very wrong with the market for individual window units in Houston. According to the electric utility, over 48,000 of them (totalling over 45,000 tons in capacity) were sold last year. Several times during the 1946-1954 period, window unit sales have pretty near doubled from one year to the next, and total sales will undoubtedly continue to increase for many years. Houston's record thus indicates a bright future for the window unit — and, for the reasons briefly mentioned above, an even brighter future for the central home air conditioning system.

We said above that there's nothing very wrong with the individual window unit market in Houston. This statement should be qualified by pointing out that it's quite competitive there — as it is elsewhere. Even early in the year, we noticed many a store window with the words "1 ton air conditioner, $199.95." Several electrical shops, not handling window units, advertised "Electric wiring for air conditioners." A window unit can be bought, in Houston and elsewhere, as an "appliance" — with the matter of its proper sizing, installation and the necessary wiring pretty much left up to the purchaser. This is unfortunate when it leads — as it has in too many cases — to units of inadequate size to do the expected job, to poor installations, and to unexpected and expensive rewiring jobs not originally contemplated.

Many of the dealer-contractors installing central home air conditioning in Houston also sell and install window air conditioners. Because of the competitive and price situation, however, they appear, in general, to be showing somewhat less interest in them than formerly and tend in several cases to handle them only as an "accommodation." For example, one dealer told us he sold 200 window units last year "just for friends and customers." Two hundred such units a year "is nothing in Houston," he said. Another dealer said that he used to do a good job on window units, but the market "was ruined now by price-cutting." Another said that window units were "hot" two or three years ago but the market "had gone to h—." A leading central air conditioning dealer-contractor (200 installations last year) "no longer does anything with window units because they are too competitive." Some dealers report they handle window units, but do not push them, and that they give "reasonable trade-ins" on units to get central jobs.

Because of the previously-mentioned Houston climate, the average capacity of window air conditioners in use there is high. For example, the average capacity of all of the window units installed through 1954 was 0.83 tons. According to the utility, the average number of window units per home (based on the number of homes with at least one unit in use) is somewhere between 1.5 and 1.8.

In summary, the window air conditioner market in Houston in past years has been very good and should so continue for some time, considering the numbers sold. As shown by the averages of capacity and number of units per home, their usage is heavy. Central system dealers report — as does the utility — that window units stimulate and lead to complete home conditioning systems. Thus, every home window unit sold paves the way to a future complete central air conditioning system. But the window unit market is quite competitive.

How air conditioning affects utilities

THE GROWING uses of electricity and water for many and varied purposes in towns and cities all over the country present a number of problems to the utilities furnishing these services. While air conditioning is not always the only cause of such utility problems, it is certainly a major one.

The electric utility serving Houston has had a summer load peak, rather than a winter peak, for the last 15 years or so. The summer peak is "running away from" the winter peak today, the winter maximum load being only about two-thirds of the summer. There were numerous burn-outs on residential transformers last year. Bigger transformers and a heavier distribution system in general are therefore needed — in

COOLING TOWERS, "almost a Houston trademark," are indications of the expansion of residential air conditioning although air cooled condensers are also popular with residents

large measure because of air conditioning's growth.

Because of the disproportion between the summer and winter peaks, the heat pump for both cooling and heating is of increasing interest to the utility.There were about 30 air-to-air heat pump installations in Houston last year. Auxiliary electric heating is also of interest to the utility, for the same reason.

Natural gas is also used in absorption equipment for home cooling. One dealer specializing in this type of system told us its installation cost is higher than for the electric job but that operating cost is lower.

Air conditioning as such is not a problem to the city water department — but keeping up with the general growth of the city and the increasing demand for water most certainly is (as it is in more and more places in recent years.) No special water permit is required in Houston, but the building inspector's office does require that a permit be obtained for the installation of a residential air conditioning system — as it does for other construction or alterations.

Water rates in Houston range from 30c per 1000 gal for the first 100,000 gal per month used and 22c per 1000 gal for the second 100,000 gal, down to 10c per 1000 gal for any use over 1,500,000 gal per month. For all use over 2,000,000 gal, the charge is 9c per 1000 gal.

Air Cooled or Water Cooled?

The air conditioning cooling tower is almost a Houston trade-mark. No one takes water from the city mains for condensing purposes and wastes it to the sewer. The cooling tower — save for the air cooled condenser — is thus an essential part of a central air conditioning installation in Houston and elsewhere, and is becoming so in other places as air conditioning expands. The growing use of the air cooled condenser as another method of water conservation has depended upon recent developments in this type of equipment.

It is quite interesting that a reason given by several dealers for the increasing use of the air cooled job in Houston is "appearance," although some dealers feel that it is due to "less service required." One dealer's job sign advertises "no tower needed."

The opinions of dealer-contractors, distributors and others the Artisan interviewed were by no means unanimous on the "air cooled versus water cooled" question. One distributor said he didn't think air cooled installations are growing as much in popularity "as some people said."

A large dealer-contractor, on the other hand, said that "air cooled is the thing." He doesn't believe that its operating cost is higher, because of the necessary servicing of water jobs. Bad water, resulting in clogged nozzles, scale, etc., is the cause of 90 percent of his air conditioning service calls, he said.

The Houston dealer-contractor selling the home air conditioning system, and selecting, furnishing and installing the equipment which comprises it, of course selects and furnishes the cooling tower or air cooled condenser, too. Several of the dealers have plumbers or pipefitters in their own organizations who make the necessary piping connections to the tower; other dealers don't hire a plumber to do the incidental piping, the plumber furnishing the lengths of pipe and the fittings, but not the tower or any other equipment.

Who are the dealers?

HOUSTON'S WINTER weather is of course a lot milder than it is in most big U. S. cities. According to the *Guide,* published by the American Society of Heating and Air-Conditioning Engineers, the winter design dry bulb temperature in common use is plus 20 deg and the yearly average degree days total 1315. Houston's summer weather is of course a different story; according to the *Guide,* summer design temperatures in common use are 95 F dry bulb and 80 F wet bulb. Too, the cooling season starts early in the year, lasts well into the fall, and on many days is a 24 hour proposition. (In one large, almost windowless commercial building, the air conditioning compressors have run 24 hours a day, 365 days a year since their installation.)

This relative severity of the cooling as compared with the heating requirements in Houston affects, to some extent, at least, the types of dealer-contractor organizations who do central residential air conditioning there. By this we mean that the "principal activity" of a number of the Houston dealers doing the work is summer air conditioning, their warm air heating jobs tending to be incidental to their cooling work. On the other hand, other leading summer air conditioning dealers are primarily warm air heating men who have gone into summer cooling with its increasing public acceptance in recent years. One of the top residential air conditioning dealers, for example, has been in the straight warm air heating business for many, many years — "starting with floor furnaces," then into regular central warm air jobs as the need for central heating became realized in Houston, and now doing a large volume of residential cooling along with his warm air work.

In contrast, other Houston dealers have gotten into central residential air conditioning and warm air — or in some cases other — heating work primarily due to the growth of air conditioning rather than as an outgrowth of their warm air heating activities. This is in contrast to more northern cities, where heating requirements are more severe and where there are thus a greater number of well-established warm air heating dealer-contractors. (In Baltimore, for example, with an average yearly total of 4487 degree days, two warm air heating dealers made over half the 190 central residential air conditioning installations last year, about 20 other dealers accounting for the remainder.)

The Artisan interviewed the Houston dealers who did from 80 to 90 percent of the central residential air conditioning business in that city last year. On the basis of this survey, it is determined that the dealers responsible for about two-thirds (perhaps somewhat over) of the volume do their own sheet metal work, the remainder subcontracting the sheet metal. One aggressive dealer not doing his own sheet metal but subcontracting it was "thinking seriously" at the time of our call of establishing his own sheet metal department. His sheet metal work has been done by three or four outside firms, but he feels he is " being forced by competition" to do his own. This same dealer mentioned that about half his volume has been commercial air conditioning and half residential. However, the residential work is growing "and soon will be the major part" of his business.

Another top dealer, who subs his sheet metal, was established with the backing of an air conditioning distributor to do residental air conditioning. He told us that he "was being forced more and more into commercial air conditioning" because the "smaller warm air heating dealers" are doing more and more of the residential air conditioning jobs. Many heating dealers have been "forced into air conditioning to hold their heating business," said one distributor.

Most of the residential air conditioning dealers in Houston are set up to handle their own pipefitting and plumbing work — though some subcontract the plumbing — and they all seem to be able to handle any necessary servicing with their own men. These dealers do no plumbing work other than connections incidental to their air conditioning installations. As several of them put it, "we do everything but the electrical connections."

Thus — while Houston's comparatively severe summer and mild winter climates, and the relatively rapid growth of residential air condi-

tioning have affected the types of dealer organizations — it is evident from the Artisan's survey that the dealer-contractors who know air distribution, do warm air heating, and do sheet metal work account for the big residential air conditioning volume in Houston.

What problems face dealers?

What are the major problems facing the dealer-contractors who install central residential air conditioning systems in Houston?

This will probably sound pretty silly to each of these dealer-contractors when he reads this Artisan report — but there doesn't seem to be any one particular problem that's bothering them all. Sure, there are problems of one kind or another, as there are in any type of business — especially a rapidly expanding one. They are real problems, of course, but they are normal business problems that can be and are being solved by the individual business men in the residential air conditioning field.

But for any big, important problem "that's holding back residential air conditioning" (we've heard it discussed at more than one trade association or other meeting) — there doesn't seem to be one in Houston. And as Houston, "the most air conditioning city," has had more experience in this field than have other cities and towns, there probably isn't one elsewhere, either.

For example, when we made our survey it was plenty warm and humid for us. But more than one dealer told us "the cool weather this year is holding back residential air conditioning." (Department stores moan every year, right after Thanksgiving, and have done it for years, that the mild weather is slowing up Christmas sales. And they do the same after the first of the year — only then it's the severe weather holding up Easter trade.) There is no denying, of course, that the weather affects air conditioning sales — particularly window units — and the more installations that can be sold, planned and installed well ahead of the cooling season the better for everyone (including the owner). But it doesn't seem to be a problem of major proportions, when the same Houston dealers reported their business well ahead of a year ago — as they did.

Price competition and price cutting — again particularly with regard to window units, but some mentioned the smaller home central jobs as well — was also mentioned by several dealers. We don't mean to minimize in any way the difficulties this creates but — unfortunately — again it's pretty much of a "normal" business problem in all fields.

A distributor of a leading make of air conditioning equipment told us that price competition was no problem at all to a dealer who really knows his equipment and the many features that make it superior. Some dealers specialize in "quality" jobs, leave those where price alone is too great a factor to others. Several said they tended to stay away from low-profit project work. One dealer mentioned, incidentally, he could buy a certain year 'round heating-cooling unit for almost $100 less than he was accustomed to pay, but hadn't done so because he is not yet "convinced of its quality."

Another distributor feels that some sort of a code to eliminate "the fringe job" is needed in Houston, and two or three dealers mentioned poor installation practices and poor service as giving air conditioning a black eye. However, a dealer pointed out to us that "we can always do something to solve a technical or service situation, so they are not problems. It's problems such as price cutting or collections that bother me."

Still another distributor told us that his biggest problem is the length of time it takes to get equipment. His dealers had many jobs "just waiting for the condensing unit." Along similar lines, a dealer told us that the manufacturers "back East" don't realize how early the air conditioning season starts in Texas. He had "a good start" on this year's business in January, he mentioned.

To sum it up — and maybe we make it sound too easy — we'd say that on the basis of our Houston interviews, the problems facing residential air conditioning dealer-contractors are pretty much normal business problems that are met in almost all fields.

Baltimore Stadium Presents Tribute in Stainless Steel

Edifice proclaims respect to war dead in huge stainless steel letters backed by city's seal in cast aluminum

BLAZING MEMORIAL, lighted at night, takes advantage of the natural luster of stainless steel and aluminum

By Don Riley

THE SIGN on 33rd St. marking the entrance to Memorial Stadium, Baltimore, Md., home of the American Baseball League Orioles and National Football League Colts, and site of some of the Navy's big football games is a truly impressive sight.

Many hands, many ideas, and approximately 1910 man hours were consumed in erecting and putting it into place, and the finished result represents worthy and precise effort combined with excellent materials and finished workmanship. It is considered, by those who should know to be the largest installation of stainless steel of its kind.

The "Memorial Stadium" letters are 10 ft high and 30 in. deep. Inscription letters vary in height within a range of 12 to 30 in.

The Hill-Chase Steel Co. Baltimore, furnished 8000 lb of type 302 stainless steel to Belsinger, Inc., by whom the sign was fabricated and erected.

Letters Require 5000 Pounds of Stainless Steel

Total weight handled for the letters was approximately 5000 lb of stainless steel in 16 and 20 gage. Approximately 3000 lb more was used on internal supports, braces and other components.

For the 10 foot letters a crane with a 140 ft boom was required. The weight of the large letters in the words "Memorial Stadium" are approximately 500 lb each topping the city's seal and proclaiming its dedication in 1954.

The dedicatory inscription was composed by a special committee of the Baltimore Park board.

Beneath the memorial "to all who so valiantly fought and served in the World Wars with eternal gratitude to those who made the supreme sacrifice to preserve equality and freedom throughout the world," a line in large letters strikingly stands out to conclude the dedication, "Time will not Dim the Glory of their Deeds."

Clarence W. Miles president of the Baltimore Baseball Club, Inc., has a definite opinion of how much the sign enhances the new, commodious and handsome stadium: "I think it is a magnificent piece of work and installation. It adds to the overall beauty of the stadium. I regard it as a beautiful tribute in written and splendidly printed words to the gallant men who gave their services and in many cases their lives. We are signally pleased with the work and construction on the part of all those who were concerned in inscribing the main entrance letters."

Despite Mr. Miles' words of high and sincere praise there was a murmur of questioning by a minority at what

was regarded at the time of erection as the somewhat unique lettering away from the orthodox. But the architect, Francis J. Tarlowski, of Baltimore, goes into detail in its defense:

Box Letters Formed from Sheets

"The box letters are made of heavy gage stainless steel sheets. The front, top sides and back of each letter are made of one full sheet of metal mitered at the corners.

"All outside sheets are fastened to an inside skeleton framework of bars, angles, separators, etc., so that no visible overlaps, joints, screws or bolts occur on the outside.

"Back lighting is produced by a row of electric lights imbedded in the concrete canopy behind the letters. The brick back wall when thus illuminated creates a glowing, soft background for the letters.

Ornament is Cast Aluminum

"The emblem of Baltimore City is a cast aluminum ornament constructed in eight pieces but without visible joints. The entire ornament stands free of the wall to which it is secured with a series of stainless steel through-wall bolts. The finish matches the stainless steel letters of the inscription.

"In the memorial inscription all letters are box type stainless steel, free standing and bolted to the wall with stainless steel bolts. The letters measure 12, 16, 24 and 30 in. in height depending on the emphasis desired.

"In general, the selection of stainless steel for the lettering was to obtain permanency and cleanliness with minimum maintenance. Installing the letters free of the wall was to make the letters self cleaning in rain. The blank wall, 11 stories high, is hardly an inviting background for scaffolding and working men perched upon it, besides being expensive. The reason for the substitution of aluminum for the City of Baltimore emblem was to save weight and to facilitate the anchorage problem involved with the large mass of the seal.

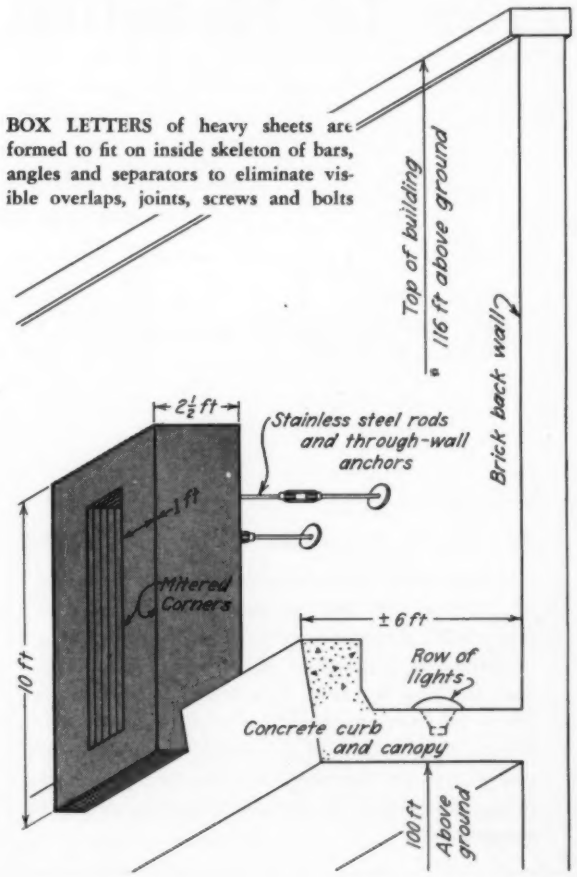
Lettering Determined by Application

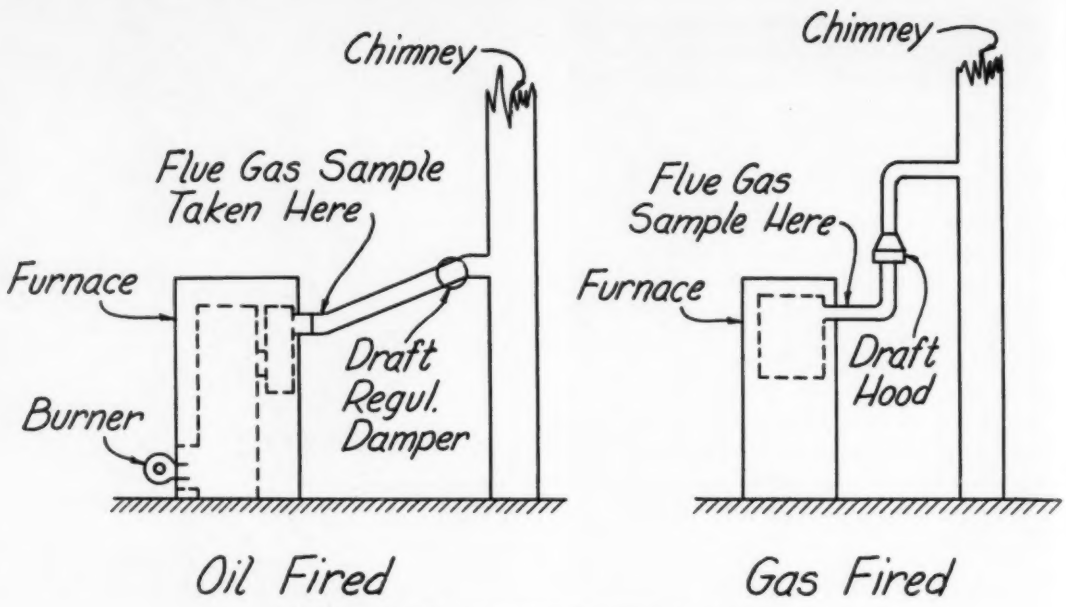
"The inscription lettering has no precedent. It is a type developed for our own use. It can be drawn with instruments on a drawing board, can be properly dimensioned and spaced, ready to be passed on to a mechanic for execution. Although it has no fancy freehand curves, it is, in my opinion, graceful and arresting to the reading eye."

Work was completed on the sign just over a year after the construction started.

The base is of concrete with the inscription letters set on cast stone. The sign is about 100 ft above the sidewalk and, according to the installers, it will last indefinitely. The only element that can dim its luster is dirt, which can be removed easily at any time with proper cleaning materials.

PLACING TOP LETTERS requires crane with 140 ft boom. The first letter of the word "Stadium" is being set at the time the photograph was taken


BOX LETTERS of heavy sheets are formed to fit on inside skeleton of bars, angles and separators to eliminate visible overlaps, joints, screws and bolts
Top of building
116 ft above ground
Brick back wall
2½ ft
Stainless steel rods and through-wall anchors
1 ft
Mitered Corners
± 6 ft
Row of lights
10 ft
Concrete curb and canopy
100 ft
Above ground



1 LOCATIONS FOR SAMPLING flue gas and making temperature measurements

How to Measure Flue Gas Losses

. . . in order to establish a set of standards for combustion efficiency of burners which the dealer can use to make accurate estimates for heating installations

By S. Konzo and H. D. Bareither
University of Illinois

The last two discussions

. . . described several tests that could be made of burner and blower operating times and from such data to arrive at some interesting conclusions regarding the burner and the blower. Now we turn to a more complicated phase of burner operation — flue gas losses. While the equipment required is more extensive than that required for the two previous discussions, it is within the heating dealer's means.

IT IS BEYOND the scope of this article to try to explain the fundamentals of combustion. However, since the subject of flue gas losses cannot be understood without some acquaintance with combustion processes, a few highlights are in order:

1) All the fuels normally burned in furnaces, boilers, and stoves are forms of hydrocarbons; that is, they contain both hydrogen and carbon. This is true of wood, fuel oil, coal, butane, propane, natural gas, kerosene, gasoline, diesel fuel, or manufactured gas. For example, a large proportion of natural gas is methane, with the chemical symbol CH_4, which of course stands for one atom of carbon and four atoms of hydrogen.

2) These hydrocarbons combine rapidly with oxygen in the process we refer to as burning. In this process the carbon of the fuel burns either completely to form carbon dioxide (CO_2), or partially to form carbon monoxide, or not at all to form soot or free carbon. When carbon burns to the complete form of carbon dioxide a large quantity of heat is released; when it burns partially to

carbon monoxide, a much smaller quantity of heat is released; and when it does not burn at all but is released as soot or free carbon, the heating possibilities are not realized. In the burning process the hydrogen of the fuel forms water vapor. Little difficulty is experienced in getting hydrogen to burn to its complete form, and a tremendously large quantity of heat is released in the process. The sole function of the combustion process, therefore, is to have the hydrocarbons in the fuel combine with the oxygen in the air and release heat energy. This can be done only when the temperature is sufficiently high for burning to take place.

3) We do not supply pure oxygen to the fuel. We know that our cheapest source of oxygen is air. As shown in Table 1, oxygen comprises only a small portion of air; in fact, the greater portion of air is composed of nitrogen, which has no influence on normal combustion.

TABLE 1 — COMBUSTION of air (percent)

	By volume	By weight
Oxygen	21.0	23.2
Nitrogen	78.0	75.5
Argon and other gases	1.0	1.3
TOTAL	100.0	100.0

The fact that 78 per cent of air is nitrogen and only 21 per cent is oxygen, means for every cu ft of air supplied there will be 3.7 times as much nitrogen supplied as oxygen. Or, for every cu ft of oxygen that is needed to burn a given fuel we shall be dragging along another 3.7 cu ft of nitrogen which is entirely useless. However, as long as we use air for burning fuels we shall have to put up with this excess baggage. The percentages shown in Table 1 apply whether we are considering sea level or an altitude of several thousand feet.

4) We are not able to burn fuels completely without supplying more than enough air to do the job. For example, if calculations show that we need only 2 volumes of oxygen to completely burn a given volume of fuel, then in actual practice we would supply as much as three or four volumes of oxygen to be sure that we have enough on hand to do the job. If we should be miserly enough to supply the bare minimum requirements of 2 volumes of oxygen, then we run the risk of getting incomplete combusion. In fact, we run the risk of producing sooty carbon and dangerous carbon monoxide gas. Not only will we be wasting unburned gases up the flue pipe, but we shall be coating the heating surfaces and the flue pipes with soot. Hence, in practical combustion work, we deliberately introduce more oxygen (and air) into the burner than the minimum requirements call for. In fact, the engineer refers to this surplus air as *excess air*, and considers any excess air of 50 to 100 per cent as being within reason. Unfortunately, the excess air we use becomes heated during the combustion process and is thrown out of the furnace—the more we throw out the greater is the loss. In other words, too much excess air is to be avoided as much as too little excess air.

5) The flue gas loss reacts as follows:

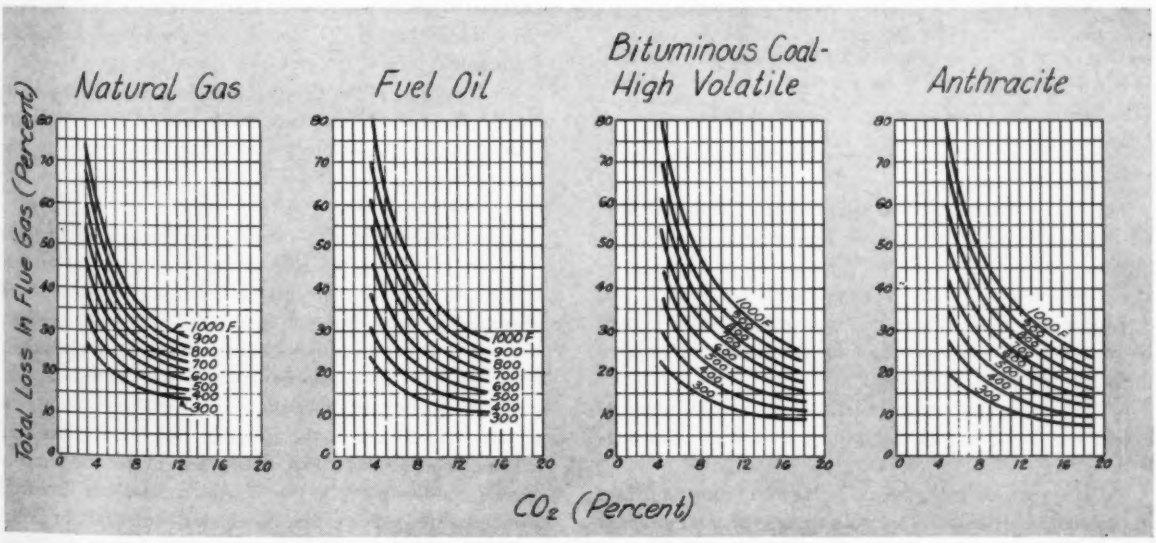
a) It increases with an increase in flue gas temperature.

b) It increases with an increase in excess air.

c) It increases if carbon monoxide is formed and wasted with the flue gases.

Two Instruments Measure Losses

The problem now is to be able to make measurements and to get an actual number for this flue gas loss. This can be done with two instruments which are commercially available. One is a glass thermometer which will indicate temperatures up to 1000 deg. F. The other is a device which will measure the carbon dioxide (CO_2) content of the flue gases. One inexpensive but reliable form of flue gas analyzer will take a sample of flue gas and give direct readings of the CO_2 percentage. The direc-



2 FLUE GAS LOSS curves (from University of Illinois engineering experiment station circular 44) using different fuels

STANDARDS FOR BURNER PERFORMANCE

CLASS A	**Flue gas loss does not exceed 17.9 percent**
CLASS B	**Flue gas losses are between 18.0 and 22.9 percent**
CLASS C	**Flue gas losses are between 23.0 and 27.9 percent**
CLASS D	**Flue gas losses are greater than 28.0 percent**

tions with this instrument should be closely followed.

Let us assume the dealer has the thermometer and flue gas analyzer, and has taken a sample set of readings of the flue gas at the points indicated in Fig. 1. Since we need readings of the combustion gases as they leave the furnace, we must be sure to locate the instruments ahead of the draft regulating damper, the draft hood, or any other opening which would permit the flue gas to be diluted with air.

Allow Burner to Reach Steady Value

Normally these readings are made after the burner has been operating continuously for at least 30 min. The CO_2 measurements can be taken within 5 min after a burner has started operating, and in such devices as gas burners and oil burners this value will be practically constant as long as the burner is operating. The flue gas temperatures, however, require considerable time to attain a steady value. The flue gas temperatures should be measured only after the burner has been operating 30 min continuously and preferably 1 hr.

Let us assume that from three separate burner installations we obtain the following three sets of data:

Installation A	Installation B	Installation C
Natural gas burner	Fuel oil burner	Stoker burning high volatile coal
Flue gas temperature: 550 F	Flue gas temperature: 650 F	Flue gas temperature: 700 F
CO_2 = 7.0 percent	CO_2 = 8.5 percent	CO_2 = 10.5 percent
Then the flue gas losses for these three cases will be:		
Flue loss = 25.5%	Flue loss = 27.0%	Flue loss = 27.0%

The data shown in Fig. 2 is reproduced from circular 44 of the University of Illinois Engineering Experiment Station entitled, *Combustion Efficiencies as Related to Performance of Domestic Heating Plants* by A. P. Kratz, S. Konzo, and D. W. Thomson (now out of print). It may be observed that each of the four groups of curves have the same ordinates, as follows:

a) The horizontal ordinate is in terms of CO_2 percentage in the flue gases, as determined from a flue gas analyzer.

b) The vertical ordinate is in terms of the total loss in per cent, and includes not only the loss of the hot gases but also the loss of water vapor escaping with the flue gases.

The fact that the flue gas loss is 25.5 percent or 27 percent is interesting, but not sufficient. The question arises as to whether a 27 percent flue gas loss for an oil burner is reasonable or excessive. Does a 7 percent CO_2 percentage call for adjustments of the burner? What is the maximum percentage of CO_2 one can reasonably expect to maintain in the field? These and numerous other questions arise. We propose a set of arbitrary standards for burner performance, as shown at the top of the first column.

By this system of classification, all three of our examples showed class C performance. In actual practice few installations will be found to fall within class A performance, and not many within class B performance.

Study Reveals Enlightening Facts

A number of interesting observations can be made from a study of the curves in Fig. 2. Some of these observations are as follows:

a) The maximum CO_2 percentages for the different fuels are not the same. For example, the maximum CO_2 for natural gas fuel is 13 percent, while that for fuel oil is 15.2 percent, for bituminous coal is 18.2 percent, and for anthracite is 19.3 percent. In general, the greater the amount of hydrogen in the fuel, the lower is the maximum CO_2 value. In field practice no attempt is made to attain the theoretical maximum CO_2 percentage, but a reasonably high value that will not result in smoke formation is sought. For example, for field installations a reasonable CO_2 percentage would be 8 percent for natural gas, 9 percent for fuel oil, 10 percent for bituminous coal, and 11 percent for anthracite.

b) If the CO_2 percentage of a given sample of flue gas is reasonably high, then little advantage is gained by trying to squeeze out a few more tenths of a per cent. For example, if the CO_2 value for a natural gas burner is 7.5 percent, the reduction in flue gas loss will be only about 1 percent for each 1 percent increase in CO_2 percentage. This is not much return for the effort involved since the increased CO_2 may bring about soot and smoke formation.

c) However, if the CO_2 value is low, then every effort should be made to increase it. A low CO_2 accompanies excess air, which indicates that the air supply to the burner should be reduced if the combustion gases are clear and not smoky.

d) The most effective manner for minimizing flue gas losses is to reduce the rate of fuel input to the burner. For a gas fired burner this may mean the gas pressure must be reduced, but not more than about 20 percent. For a gun type oil burner a reduction in nozzle size might be possible if the nozzle in use is larger than 0.75 gph.

This reduction in rate of fuel input will reduce the rate of heat release within the furnace, and for a given heat exchanger will bring about a reduction in flue gas temperature. Studies made in the Warm Air Heating Research Residence have shown that reductions in the rate of firing a furnace is one of the most effective means of cutting down on fuel bills.

How to Lay Out a

Transition Duct with 30 Deg Twist

. . . where space problems dictate use for an offset between the horizontal and vertical duct runs using conventional elbow fittings

An equipment layout plan with an oven located in a recessed corner of a chemical laboratory is shown in Fig. 1. A stainless steel hood and exhaust duct system was called for in the specifications.

The wall recess necessitated provision of an offset between the horizontal and vertical duct runs. To eliminate a complicated transition elbow connection from the horizontal to the vertical duct, a simple twist duct transition fitting was designed below the elbow, making possible the use of standard conventional elbow fittings.

To find the angle of twist in the vertical duct, it is necessary to position the square duct and the rectangular duct line X-X on the plan view, Fig. 1. On the extended line X-X, establish the given radius point R and draw the required degree elbow. The side of the twisted transition duct must be parallel to and equal in length to side Y-Y of the elbow.

To determine the width of the rectangular duct, find the area of the square duct in sq in., and divide by the horizontal length of the rectangular side.

Example: If the given duct connection at the hood is 18 × 18 in., and the horizontal length of the rectangular duct side is 24 in., the width of the rectangular duct side would be equal to (18 × 18)/24 or 13½ in.

The following is a step by step analysis of the pattern problem solution:

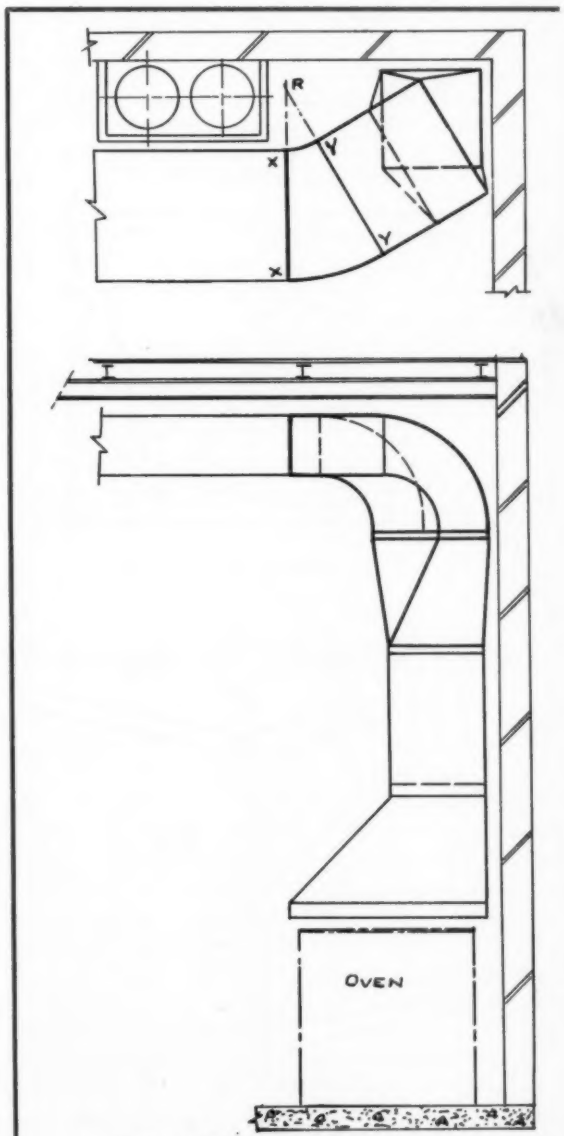
To Construct the Working Drawing, Fig. 2 —

(a) Draw the 1½ in. square marked S-T-U-V. From point S, measure ⅜ in. up and ⅛ in. to the right of line S-V, and establish point W. Through point W and to the right, draw a line at a 30 deg angle to line S-T. Measure 1½ in. on this line from point W and mark the point X.

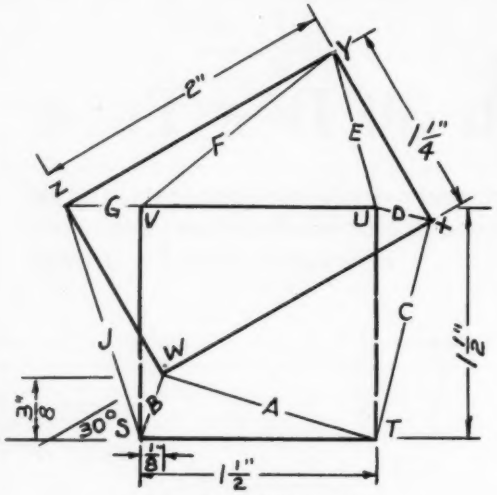
(b) From points W and X, draw lines perpendicular to line W-X. Measure 1¼ in. on both lines and mark the points Y and Z. Draw the line Y-Z.

(c) From point T on the square, draw work lines to points W and X and mark the lines A and C.

(d) From point U on the square draw work lines to points X and Y on the rectangle, and mark the lines D and E.

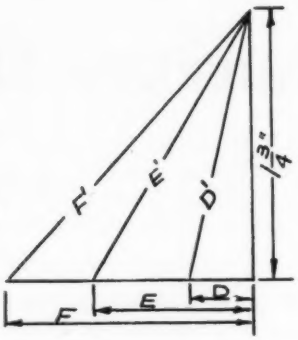


1 PLAN VIEW (top) and front view of oven located in a recessed corner, showing transition fitting placed below the elbow

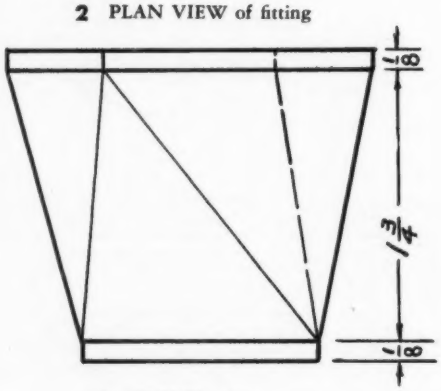


2 PLAN VIEW of fitting

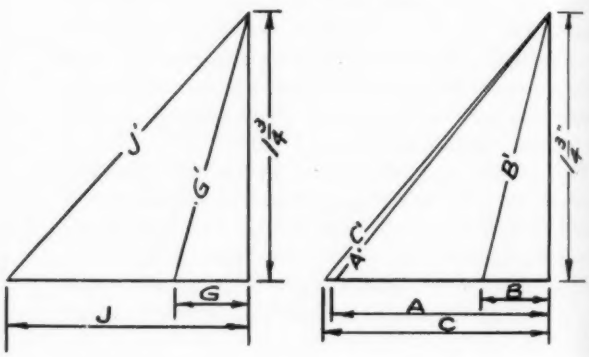
PICTORIAL drawing

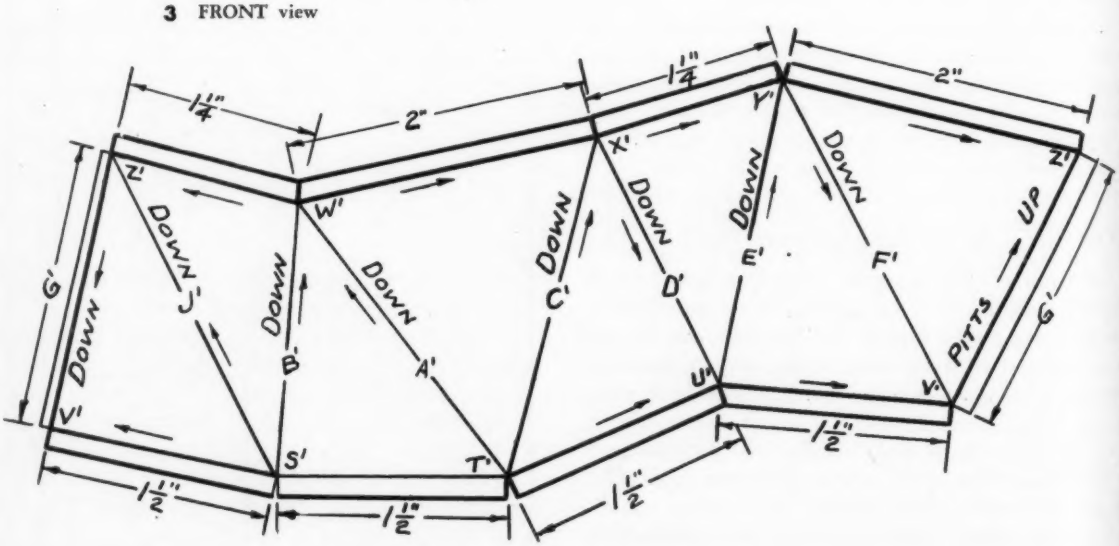


TRUE LENGTH lines



3 FRONT view





4 PATTERN LAYOUT for transition duct

(e) From point V on the square, draw work lines to points Y and Z on the rectangle, and mark the lines G and F.

(f) From point S on the square, draw work lines to points W and Z on the rectangle, and mark the lines B and J.

To Lay Out the Pattern, Fig. 4 —

(a) Draw the 1½ in. horizontal line S′-T′. To develop the true length lines, draw a right angle. Transfer line A from Fig. 2 to the horizontal leg of the right angle and given height 1 ¾ in. from Fig. 3 to the vertical line. The hypotenuse A′ is the developed line. With T′ (Fig. 4) as center, the radius A′, draw an arc. Transfer Line B (Fig. 2) to the horizontal leg of the right angle and the given 1 ¾ in. height to the vertical leg. The hypotenuse line B′ is the developed line. With point S′ (Fig. 4) as center, and radius B′, cut the arc A′ and mark the point W′.

(b) On a right angle, measure 1 ¾ in. on the vertical leg, transfer line J (Fig. 2) to the horizontal line. The hypotenuse line J′ is the developed line. With point S′ (Fig. 4) as center and radius J′, draw an arc to the left of point W′. With the 1 ¼ in. line Z - W (Fig. 2) as radius and point W′ (Fig. 4) as center, cut the arc J′ and mark the point Z′.

(c) The line G is transferred from Fig. 2 to the horizontal leg of a right angle and the given 1 ¾ in. distance to the vertical leg. The hypotenuse G′ is the developed line. With point Z′ (Fig. 4) as center, and radius G′, draw an arc to the left of point S′. With the 1½ in. line S-V (Fig. 2) as radius and point S′ (Fig. 4) as center, cut the arc G′ and mark the point V′.

(d) Transfer the 1 ¾ in. height line (Fig. 3) to the vertical leg of a right angle, and transfer line C (Fig. 2) to the horizontal leg. The hypotenuse line C′ is the developed line. With point T′ (Fig. 4) as center and radius C′, draw an arc to the right of point W′. With the 2 in. length W - D (Fig. 2) as radius and point W′ (Fig. 4) as center, cut the arc C′ and mark the point X′.

(e) The line D is transferred from Fig. 2 to the horizontal leg of a right angle, and the given 1 ¾ in. vertical height is measured on the vertical leg. The hypotenuse line D′ is the developed line. With point X′ (Fig. 4) as center and radius D′, draw an arc to the right of point T′. With the 1 ½ in. length T - U (Fig. 2) as radius and point T′ (Fig. 4) as center, cut the arc D′ and mark the point U′.

(f) Measure line E (Fig. 2) on the horizontal leg of a right angle, and height line 1 ¾ in. (Fig. 3) on the vertical leg. The hypotenuse line E′ is the developed line. With point U′ (Fig. 4) as center and radius E′, draw an arc to the right of point X′. With point X′ (Fig. 4) as center and radius 1 ¼ in. (line X - Y, (Fig. 2) cut the arc E′, and mark the point Y′.

(g) Transfer line F from Fig. 2 to the horizontal leg of a right angle, and the 1 ¾ in. height (Fig. 3) to the vertical leg. The hypotenuse line F′ is the developed line. With point Y′ (Fig. 4) as center and radius F′, draw an arc to the right of point U′. With the 1½ in. line length U - V (Fig. 2) as radius and point U′ (Fig. 4) as center, cut the arc F′ and mark the point V′.

(h) With developed line G′ as radius, and point V′ (Fig. 4) as center, draw an arc to the right of point Y′. With the 2 in. line Y - Z (Fig. 2) as radius and point Y′ (Fig. 4) as center, cut the arc G′, and mark the point Z′.

Through the developed points, draw the pattern outline. Add the ⅛ in. flange allowance, the Pittsburgh lock seam allowances, and mark the pattern for fabrication.

When is Additional Sound Control Called For?

GOOD SOUND LEVEL control depends first on the nature of the structure itself and second upon installation arrangements of the equipment itself, says Mr. R. A. Gonzalez, director of application engineering, Airtemp division, Chrysler Corp. He adds that it becomes necessary for the installer to judge both the acoustical value of the space to be air conditioned and the sound level of the normal occupancy of those spaces. Good acoustical arrangement and high levels of occupancy noise require the minimum by way of acoustical treatment of air conditioning supply and return arrangements.

The normal acoustical qualities of a residence plus the very low sound level of normal occupancy (particularly during the night hours) dictate the advisability of additional sound treatment both in the supply and return ducts, Mr. Gonzalez stated. Noise will come out of the return air arrangements as readily as it will out of the supply arrangements since the speed of sound is approximately 1100 fps. It is therefore equally important to treat the supply and return air arrangements of an air conditioning system.

The higher quality homes frequently require special consideration of the sensitivity of the individual owner's noise perception, he observed. Some people are highly sensitive to sound level and are willing to spend additional money for added quietness. Arrangements for theaters, churches and mortuary chapels are less exacting than residences. But they frequently present some problems due to the larger size of equipment required.

Excellent recommendations for acoustical treatment of theaters are available, he said, adding that these recommendations may be used for churches and similar spaces where low sound levels are desired.

Sales Minded Management Leads the Way

. . . to mounting sales volumes in heating and air conditioning in an organization which stresses planning, selling and teamwork in a highly competitive area

By Robert F. Welch

DIVERSIFIED BACKGROUNDS in the heating-air conditioning business pay off for partners (from left) Don Sullivan, Don Will and Bob Hall in formulating company policies and increasing business volume

EVERY PHASE of business operation at Southland Heating, Inc., Long Beach, Calif., is made more efficient by a well planned organization which keeps costs at a minimum and sales volume high. The framework of managerial responsibility facilitates long range planning and at the same time keeps all wheels turning smoothly in the multitude of details which are part of daily routine in a large heating and air conditioning business.

Southland Heating has three major stockholders who jointly formulate company policy. Their duties are clearly defined and they operate like a well trained basketball team instead of at cross purposes as is sometimes the case in multiple-owned businesses in which all partners are active.

Management Has Well-Rounded Background

This teamwork comes naturally, since the three principals have backgrounds which supplement each other. Don Will, president and general manager, is a mechanical engineer. Bob Hall, whose father was a successful automobile dealer, grew up in sales work. Don Sullivan is a licensed accountant.

Back in the days when Payne Furnace Co. operated its own installation and service departments, the three owners were employees of the Long Beach branch. Mr. Will was manager and Messrs Hall and Sullivan served as salesmen. When the company decided to concentrate on manufacturing exclusively, the three combined forces and took over the branch. Three other key persons were included as stockholders: Margaret C. Stimson, assistant secretary; Charles Watson, general superintendent; and Lawrence Redwine, residential foreman. These six people have operated the business at the same location ever since its inception.

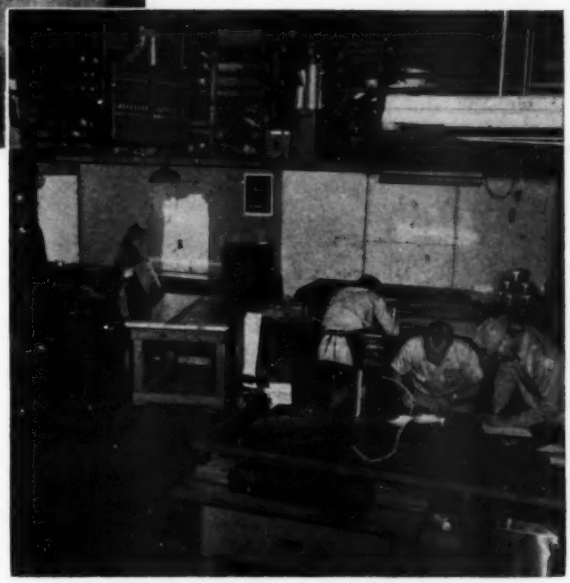
During the past six years the payroll has grown from 20 to 70 employees. Quality workmanship, good service and careful planning are responsible for that growth. One of the first changes instituted by the new ownership was to switch emphasis from residential to commercial

SALES ARE BORN in modern sales office where each salesman has his own desk

work. "We immediately established a policy of taking any type of job, in any locality, utilizing any kind of equipment," explains Mr. Will.

The owners recognized that service and new residential construction were less lucrative fields in their particular area than in other parts of metropolitan Los Angeles. Service couldn't account for too much volume in Long Beach because of the relatively small proportion of large homes. New house construction, typified by the huge tract in nearby Lakewood, became so competitive that the lower bidders found themselves paring profits to the bone when they were awarded the contracts. While Southland installs a certain amount of tract heating, it is for builder accounts which they serve regularly in other types of construction.

Their service department, operated as a customer accommodation as well as for profit, has grown each year. This department, under Service Manager Herb Prosser, is being developed for a healthy and more profitable growth.



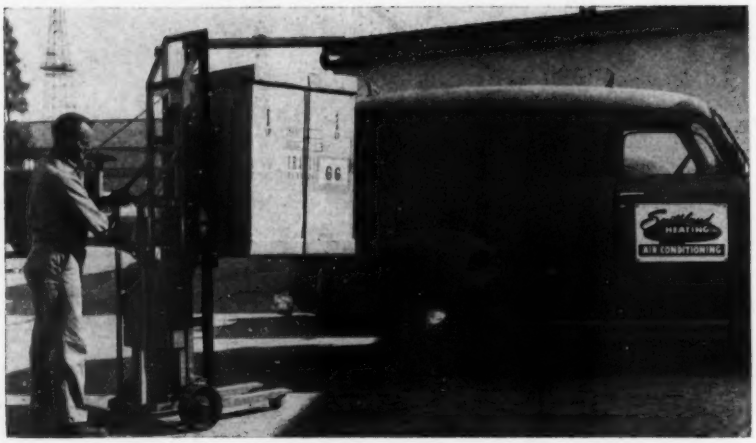
AFTER THE CONTRACT is awarded, parts are prefabricated in the spacious shop for installation crews. Mezzanine provides additional storage space

Program Geared to the Future

Should new building take a serious dip, the organization is prepared to compensate for the drop in volume. First of all, their service calls on a contract basis encourage greater efficiency. Secondly, qualified mechanics bring in extra profit dollars through their knowledge that practically every service call reveals a potential additional sale which may make the difference between profit and loss. Constant employee training, additional salesmen, and possibly some type of incentive pay which wouldn't encourage replacement of perfectly good parts are Southland's goals for profitable service volume.

The partners hold regular meetings to hash out current problems including collections, sales, installation, etc. Arguments don't develop because each respects the others' judgements. Mr. Will has charge of installation

PROGRESS IS CHECKED constantly on the job board where colored tacks show credit standing and progress of all current jobs



MODERN EQUIPMENT which facilitates and speeds up the work includes battery powered fork lift with 1600 lb capacity

and engineering; Mr. Hall handles sales, promotion and advertising. As comptroller, Mr. Sullivan is responsible for credit and collections; purchasing and capital expenditures; budgeting and financing; and costing and inventory control.

Out of these meetings grows an important management tool — projection of both sales and profits by departments for the ensuing year. The company always knows how current results stack up against pre-established quotas. With a tight knit organization it is possible to immediately concentrate on any department which is falling behind. A budget analysis is made quarterly.

Budget corrections are made on the basis of profits rather than sales. For example, if new residential installations aren't up to the quota it doesn't necessarily mean that greater effort will be exerted behind them. Greatest attention is paid to those categories which promise the largest profit at the moment. A drop in residential volume becomes significant only if the profit has not been made up in other departments.

Selling is the Keynote

All three principals are young men; probably because they all have backgrounds in sales work, selling is regarded as one of the firm's most vital functions. While Southland gets most of its business through competitive bidding, the constant sales program means that jobs come in at the right price and none are lost through lack of followup with general contractors or builders.

"Selling is the lifeblood of this organization," says Mr. Hall. "We have four engineering salesmen who design and create installations. Two commercial work estimators also act as salesmen. In addition, each of the three owners has his own accounts. That makes a total of nine people who are out after new business."

Salesmen are paid on a sliding scale, with commissions running roughly between 1 and 10 percent. The goal is to pay according to the amount of energy expended — 10 percent on a residence or small commercial installation, less on a larger contract which may entail no more time to complete the sale.

A two-man engineering staff is maintained primarily to free the owners of desk work. Except for special jobs, salesmen are able to do all of their own engineering. When they do require staff services, the cost comes out of their commissions if they can't charge the job to engineering service.

A good salesmen makes between $8,000 and $10,000 per year. He is working against a quota established by the management. For every month he makes the quota he gets gas, oil, lubrication and wash jobs on his car for the following month, which amounts to another $25 to $50 in income. The quotas are set low enough so he has a good chance of meeting them, yet sufficiently high to cause him to miss once or twice a year. This arrangement furnishes an incentive for the salesmen to keep quotas as high as possible.

A significant note is the fact that 75 percent of the dollar volume is in the commercial category whereas sales effort is expended on only 40 percent of it. Only a small portion of this effort is in goodwill calls; it's mainly following up on direct inquiries and the information in permit services. The owners admit that over the long haul it's desirable to foster goodwill by personal contact, but their men are so busy on productive work that they have little time for such calls under present arrangements.

Consistent Advertising Pays Off

The salesmen are supported by an advertising program of approximately $600 per month. Nearly half of the commissionable sales are generated by this advertising. It's a constant program in newspapers, directories, etc. which keeps hitting prospects week after week throughout the year.

"We do all that's humanly possible to level the load between seasons," Don Will says. "One of the advantages of a selling type of organization is that our reputation isn't based on always being the lowest bidder. When things slack off a bit we've got the staff to bring in more business. We have a broad foundation to work on — spending our energy in whatever classification is most active. And if somebody gets sick or has an accident it

doesn't throw the organization into an uproar or mean that part of the crew will be laid off."

A display room also supports salesmen's activities. In fact, it's largely a prestige factor. Customers are invited to come in to see various kinds of equipment. The showroom occupies part of the 6000 sq ft devoted to offices and stock. The sheet metal shop occupies an additional 4000 sq ft. There's also a 6000 sq ft paved yard for outside storage and handling area.

Business Picture Reviewed Periodically

The accounting department furnishes management with monthly sales totals, broken down between residential and commercial and also showing amounts credited to each individual salesman. This report is used as a guide along with other data supplied by the office, including a "year to date" statement compared to the budget for the same period in the preceding year.

A progress board breaks down the labor percentages and total cost expended on all work in progress. Upon completion, all commercial jobs receive a cost analysis for comparison with the estimate. Foremen and superintendents are given time allowances on all work assigned to them, and occasionally smaller work is analyzed from a cost standpoint. For instance, all furnace installations will be carefully inspected periodically to see that costs are in line. If not, installation and sales determine whether the price is too low or the method of installing too costly.

Every month sees a complete physical inventory of all stock on hand. Perpetual inventory records on furnaces, controls and other higher priced merchandise is then corrected by the company's chief purchasing agent. The inventory also makes it possible to compile an accurate monthly profit and loss statement. The owners are always aware of changing conditions and don't have to wait until the end of the year to determine how they are doing.

Another monthly statement shows accounts receivable, segregating those which are 30, 60 and 90 days overdue. The owners find this information very valuable and see to it that their supervisors know when an acount is going sour. Focal point for this control is a large board in the superintendent's office which shows the current status of every job in progress. A red thumb tack opposite a job means office approval must be secured before the job can proceed on schedule. A green tack means payment has been received, credit is clear and the foreman can proceed with any additional work requested by the customer. Separate boards are used for air conditioning, project, heating, ventilating and floor furnace jobs.

Key employees have been with the firm four or more years — a good record, considering the fact that the company is only six years old. The owners sponsor bowling teams, stage picnics and parties, give away Thanksgiving turkeys and Christmas gifts, and present older employees with five-year pins. The pins have been well received and will be supplemented by others denoting 10, 15 and 20 years of service when the firm is old enough to make such awards. A monthly newspaper, *Southlander*, is edited as an extracurricular activity by Jack Griffith who is in charge of the warehouse and yard and is in contact with interesting field developments and gossip. Various department heads are his reporters, furnishing information on company news.

Industry Needs Better Public Relations

RECENTLY WE were with a group of editors invited to see the new heating controls and control systems being developed and tested at the Minneapolis-Honeywell Regulator Co. research laboratories. During our visit, many of the company's key men expressed their points of view on the heating industry's future. Among them was Tom McDonald, executive vice president, who said: "You gentlemen attend many more meetings than I do and I would not be surprised if you are almost as tired as I am of listening to authorities discuss the shortcomings of the heating industry. The industry *is* backward in some respects, but it is not as bad as some people would have us believe. The significant progress that has been made in the last decade in engineering improvements, the development of combination heating and cooling equipment, styling, the improvements in efficiency, did not just happen, but are the results of a thoughtful, conscientious industry.

"In fact, I don't think there is anything wrong with the heating industry that more and better advertising, more and better publicity and more and better selling will not correct.

"It is a pity that we have not made the consumer more conscious of the fact that there is nothing so fundamental to gracious, comfortable and healthy living as good heating. That there is no other single feature that can be designed into a home that will do more — more of the time — for its occupants than well-planned temperature.

"I earnestly believe that money invested in making the homeowner *care*, *know* and *think* as much about heating as they do about many other things will yield rich returns.

"I have gathered some data that I believe will be of interest. It is based upon pre-war costs vs current conditions. This data shows that straight time hourly earnings, as compared with pre-war, have increased 170 percent. On the same basis, materials have increased 159 percent. It is interesting to look at this card on groceries to see that they have increased 327 percent. Automobiles have gone up 122 percent. Figures I have been able to get on our own industry show that water heaters have increased 28 percent and forced air furnaces 15 percent. Selling prices in the heating industry have not kept pace with increased costs. Low profits make it impossible to build for the future. Successful business and profit go hand in hand. One cannot exist without the other."

Know the Procedures for Measuring Equipment Ratings

A review of basic facts about air conditioning performance and an outline of accepted rating methods is presented as a useful tool for dealers

By S. W. Reid

Air Conditioning Engineer
Gilbert Associates, Inc.

ALTHOUGH public confusion about air conditioner ratings has been used to advantage by some companies for sales purposes in "over-optimistic" equipment ratings the malignancy of such practice has been recognized by industry leaders almost from its inception and there is at present a concerted effort being made by the Air-Conditioning and Refrigeration Institute and the National Better Business Bureau to correct the situation. All dealers should be vitally interested in this problem and its solution. They can be better prepared to lend support by becoming familiar with industry recognized standards for air conditioning performance.

Consider Performance Facts

Before getting into a detailed discussion of standards, we should first review some basic facts about air conditioning performance which a dealer should keep in mind when considering published unit capacity information.

An air conditioner contains a refrigeration system consisting of three major components: the evaporator, the condenser and the compressor. The designer selects these components to produce a certain cooling effect when heat is supplied to the evaporator and removed from the condenser at certain rates and temperature levels. It is characteristic of a refrigerating system that a change in either the heat supplied the evaporator or removed from the condenser will be reflected as a change in the cooling effect. It will also be reflected as a change in the power input to the compressor motor.

The above can be stated more specifically as follows:

1) The cooling capacity of a given refrigerating system which is functioning properly is greatest when the operating pressures of the compressor are closest together and least when these pressures are farthest apart.

a) The suction pressure drops whenever the wet bulb temperature and/or quantity of air entering the evaporator are reduced.

b) The suction pressure rises whenever the wet bulb temperature and/or quantity of air entering the evaporator are increased.

c) The discharge pressure drops whenever the temperature of water or air entering the condenser is reduced or their quantity is increased.

d) The discharge pressure rises whenever the temperature of water or air entering the condenser is increased or their quantity is reduced.

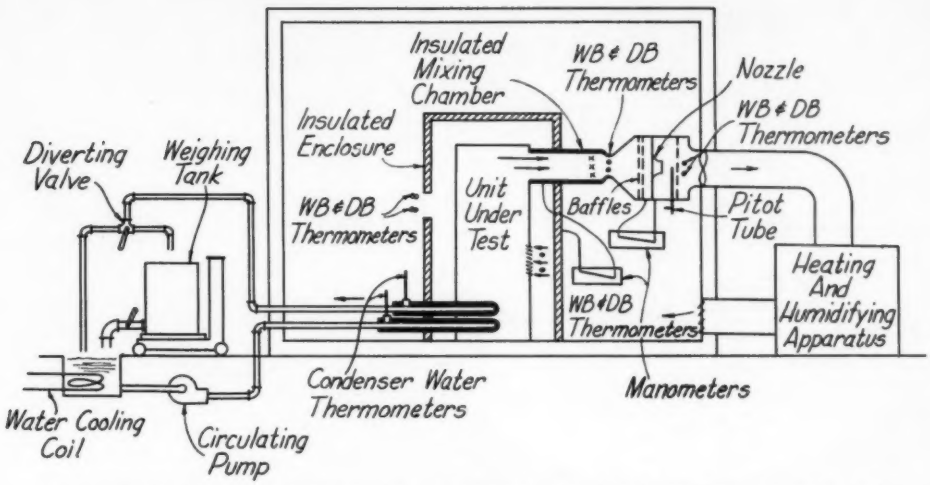
2) The power required by a given refrigerating system which is operating properly is greatest when both suction and discharge pressures are simultaneously at their maximum. For a given discharge pressure, a drop in suction pressure in accordance with *la* above will cause a slight drop in the power requirement. For a given condition of air entering the cooling coil, a drop in discharge pressure for cause *lc* above will cause a noticeable reduction in power input.

In the preceding outline it has been shown that the cooling capacity and power input of an air conditioner are not fixed as, for instance, are the light output and power input of an electric bulb. To have significance, the former quantities must always be related to heat entering the evaporator and leaving the condenser as defined by the temperatures and quantities of air or water used to convey the heat.

Rating Should Be in Btu

The capacity of an air conditioner is properly given in terms of Btuh or tons (1 ton equals 12,000 Btuh), and the power input requirement is properly given in terms of watts or kilowatts (1 kw equals 1000 watts). Horsepower has no significance except as a nominal designation arbitrarily used by the manufacturer to show the approximate size range into which his compressor motor falls.

To illustrate this point consider two air conditioners which are iden-



1 METHOD A SETUP (psychrometric calorimeter) is preferred procedure for testing and rating self contained air conditioners with water cooled condensers

tical except that one has an air cooled condenser and the other has a water cooled condenser. Assume that both units are powered by identical compressors which fall in the nominal 3 hp size range. Based upon the preceding discussion, the dealer should appreciate that even though both units are "3 hp" units, the water cooled unit is likely to have the greater capacity and lower power input. The reasoning is this: assume that water is available from a cooling tower at a maximum temperature of 80 F. Figuring roughly on the basis of 30 gal-deg per ton we should have a 10 deg range if 3 gpm per ton were circulated making the leaving water temperature 90 F. Let us assume on this basis that the condensing temperature is 10 deg above the leaving water temperature (100 F).

Now consider the unit with the air cooled condenser. The maximum air temperature in this case is assumed to be 95 F as it enters the condenser. To pick up heat the air must rise in temperature, so let us assume that it leaves the condenser at 115 F. The condensing temperature must be above this, and 125 F would not be an unreasonable guess as to what it might be. From what has been said, the system having a compressor operating at the higher temperature will have the lower capacity.

Thus, air conditioner capacities are comparable only if they have been determined under comparable conditions. To establish uniformity in the testing and rating of air conditioning equipment, the industry has set up certain codes and standards which we shall now consider.

Standards Are Available

There are two standards particularly relating to residential air conditioners. Both were set up and have been revised from time to time by industry committees. Conformance with either standard is entirely voluntary, but any equipment represented as being in accordance with either must conform with all of its provisions. One standard is *Equipment Standards of the ACRMA Self-Contained Air Conditioner Section, No.* 210. (ACRMA is now ARI, Air-Conditioning and Refrigeration Institute); the other is ASRE (The American Society of Refrigerating Engineers) Standard 16-53, *Methods of Rating and Testing Air Conditioners.* We shall refer to the former as Standard 210 and the latter as Standard 16-53.

Standard 210 applies specifically to air conditioners which range from 1½ to 25 tons in capacity. In this classification is the self contained or packaged unit being offered for residential use. The standard lists all the major components recommended to be furnished as standard equipment with each unit. It recommends that self contained air conditioners be rated and tested in accordance with the ASRE Standard which we shall discuss a little later.

One of the most important parts of Standard 210 is section 8, entitled *Design Operating Conditions.* This states in part the following:

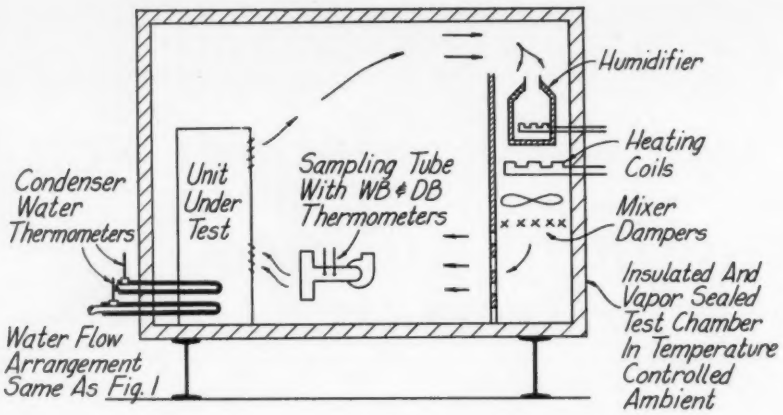
"It is recommended that self-contained air conditioners with water-cooled condensing units, or absorption refrigeration units, be designed to operate continuously under [certain] maximum operating conditions." (See table 1, page 84).

Testing Methods Described

Standard 16-53 describes in detail correct methods for testing most of the combinations of refrigerating equipment used for air conditioning. In order to limit this discussion we shall cover just one of these methods, the one prescribed for a self contained air conditioner with a water cooled condenser. Readers who are interested in tests for other types of systems can obtain a copy of the standard from the American Society of Refrigerating Engineers.

Among the first items defined in Standard 16-53 are the *Standard Rating Conditions.* For self contained air conditioners with water cooled condensers these are as follows:

Barometric Pressure — in. mercury 29.92
Temp. of air entering unit dry bulb F 80


Humidifier
Heating Coils
Mixer Dampers
Insulated And Vapor Sealed Test Chamber In Temperature Controlled Ambient
Sampling Tube With WB & DB Thermometers
Unit Under Test
Condenser Water Thermometers
Water Flow Arrangement Same As Fig. 1

2 METHOD B is also a psychrometric calorimeter method for testing and rating; method is somewhat more restricted than method A

Temp. of air entering unit wet bulb F 67
Temp. of water entering condenser F 75
Temp. of water leaving condenser F 95

Published ratings of equipment which conforms to the standard are identified by the following statement: "Ratings based on tests conducted in accordance with ASRE *Standard Methods of Rating and Testing Air Conditioners, Standard* 16-53." Ratings should state whether the unit is primarily intended for use inside or outside of the conditioned space and upon which of these arrangements the rating is based.

Calorimeters Find Capacities

Standard 16-53 specifies two somewhat different setups for determining the capacity of a self contained water cooled air conditioner. The technical names given to these are the psychrometric type calorimeter and the room type calorimeter. For convenience we shall label them method A and method B respectively.

Method A is illustrated in Fig. 1. The test unit is installed within an insulated enclosure which is in a test chamber. The insulated enclosure must be large enough to permit circulation of the inlet air between the enclosure and the air conditioner without excessive restriction. The minimum clearance between the unit and the enclosure is 6 in.

Air enters the enclosure from the side opposite the test unit inlet in order to create air circulation. All openings in the enclosure for the passage of plumbing and electrical lines are kept as small as possible so very little air will enter the enclosure except through the intended inlet.

The conditioned air outlet or outlets of the air conditioner are connected to an apparatus as shown in Fig. 1. This unit consists of an insulated mixing chamber which is restricted to obtain an air velocity of at least 700 fpm over the thermometers. Air from the mixing chamber then enters a receiving chamber with diffusion baffles whence it passes through one or more nozzles into a discharge chamber and through an exhaust fan. The nozzles are sized to provide a throat velocity of not less than 3000 fpm and are spaced in accordance with recommendations in the standard.

Water piping to the test unit condenser is insulated at the points of temperature measurement and between those points and the unit. Water flow is measured by weighing an accumulated amount in a tank having sufficient capacity to retain the flow for at least two minutes. A diverting valve is used to direct the water into the weigh tank during test intervals.

Thermometers for measuring wet and dry bulb temperatures are placed at the inlet to the test unit enclosure and at the inlet of the test unit itself. If the air velocity at these points is less than 700 fpm, sampling tubes must be used. These consist of a

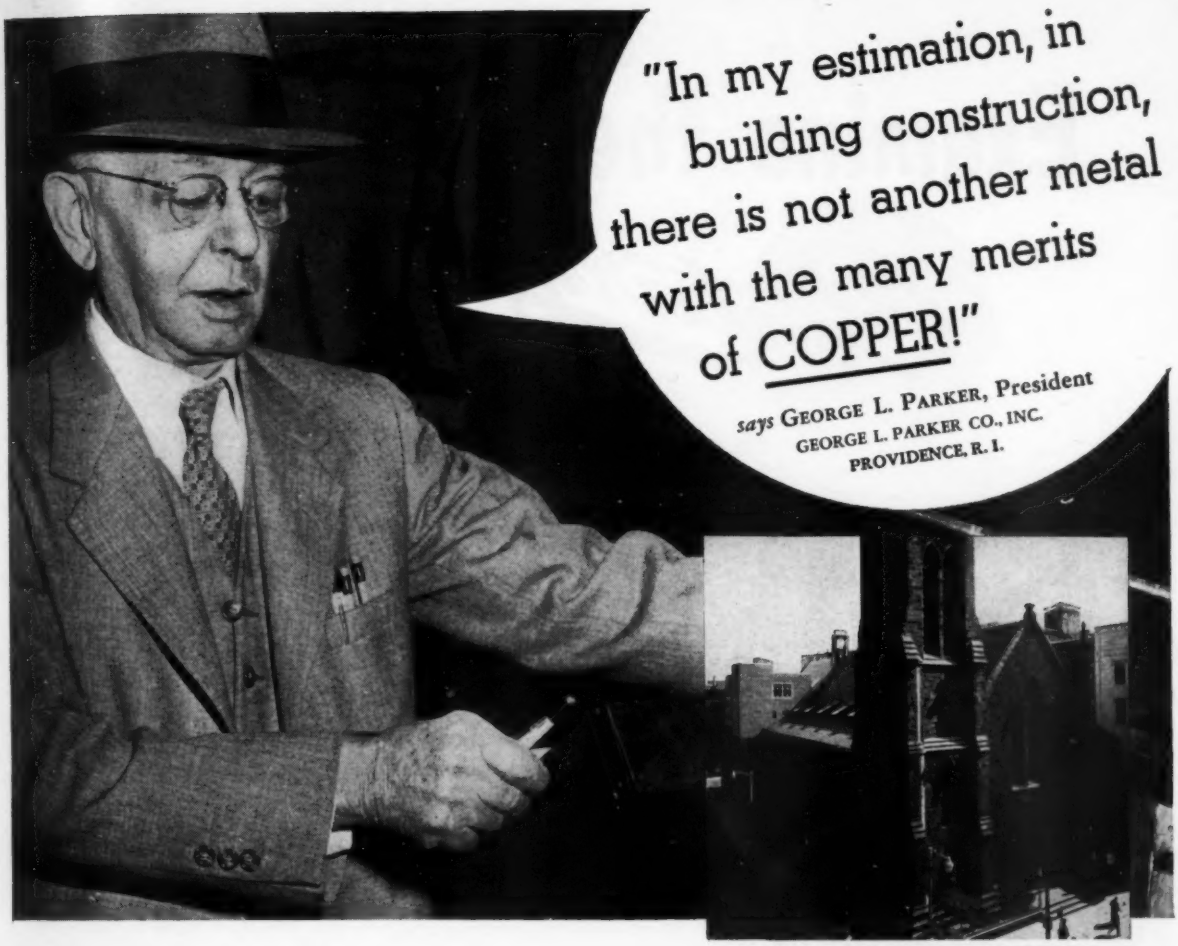
(*Continued on page* 84)

A SPECIAL SERIES

. . . of articles of interest to the residential air conditioning dealer is based on the author's wide experience in the field. The discussions began with consideration of the fundamentals and operating characteristics of residential cooling units, then turned to specific problems, service and installation techniques. Earlier articles have treated such contemporary subjects as types and characteristics of refrigerants, lubrication, charging and trouble shooting procedures, managerial problems, installation techniques, modernization and zoning.

CONTINUING THE APPROACH

. . . we will investigate more of the cooling dealer's problems, analyzing subjects such as liquid and suction line sizing, blower operation in summer and winter, eight different combinations for heating and cooling units and cooling problems in an old two story house.



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says GEORGE L. PARKER, President
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PROVIDENCE, R. I.

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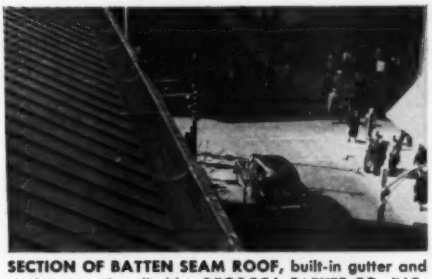
Ask your distributor to show you. Also ask him about the neat-appearing, weather-tight, easy-to-place Revere-Keystone 2-Piece Cap Flashing.* **Patented. No. 2,641,203. Other Pats. Pend.*



SECTION OF BATTEN SEAM ROOF, built-in gutter and coping cover installed by GEORGE L. PARKER CO., INC., with Revere Leadtex Copper furnished by CONGDON & CARPENTER, Revere Distributor in Providence.

NOTE WHAT A NEAT INSTALLATION was made around these skylights with easy-to-work Revere Copper. Architects were MAC CONNELL and WALKER of Apponaug, R. I. Installation was made in accordance with recommendations made in Revere Booklet, "COPPER AND COMMON SENSE." Do you have a copy?

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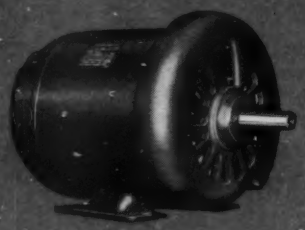

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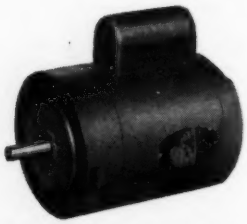

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Century application engineers or authorized Century distributors are always at your service to help you fit a Performance-Rated motor to your job.

ROTOR

practically indestructible, high-pressure die-cast aluminum squirrel-cage rotor... assures uniform cross section of winding. Large capacity fans are cast integrally with the rotor winding for improved ventilation.

INSULATION

stator winding slots are insulated with laminated rag stock paper and costly "Mylar." "Formvar" plastic insulated wire is used for the coils. The complete stator winding is dehydrated and saturated with thermal setting baked plastic varnish.

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the time-tested wool yarn method of cleaning and circulating the oil... large capacity reservoir.

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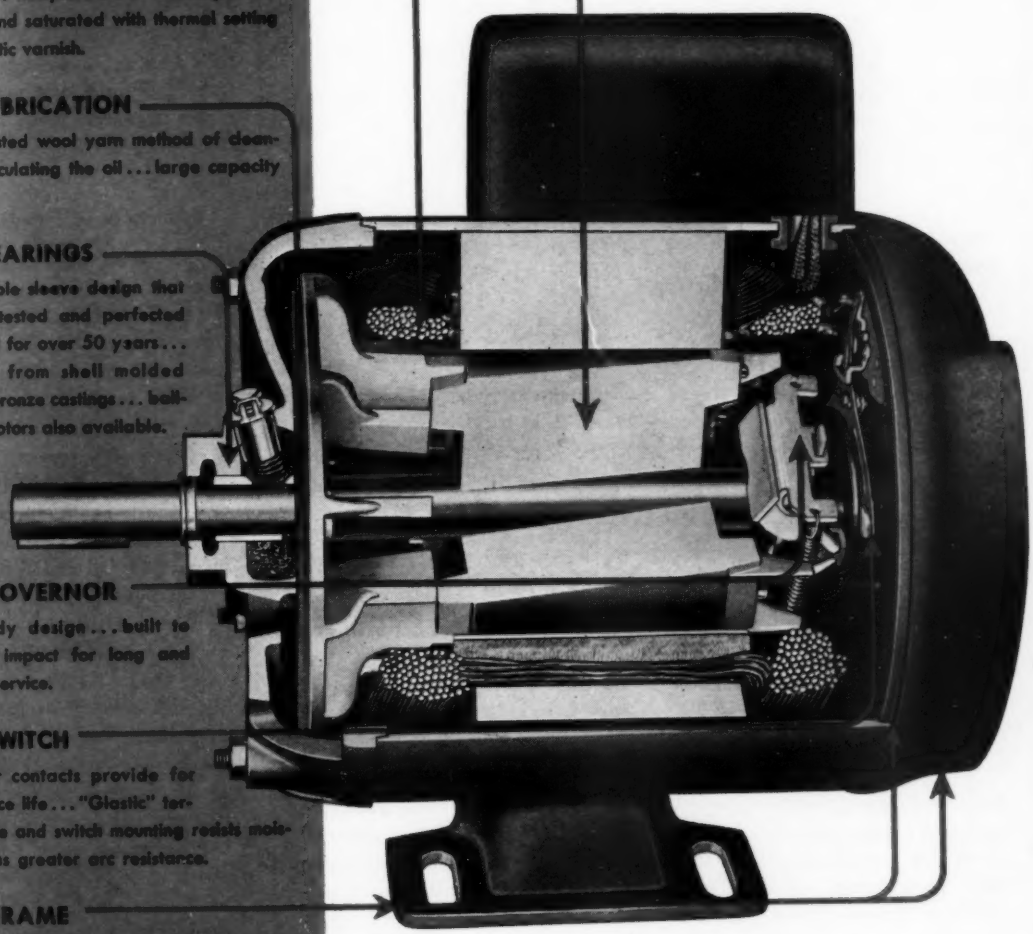
same reliable sleeve design that has been tested and perfected by Century for over 50 years... machined from shell molded Phosphor bronze castings... ball-bearing motors also available.



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new, sturdy design... built to withstand impact for long and accurate service.

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coin-silver contacts provide for long service life... "Glastic" terminal base and switch mounting resists moisture... has greater arc resistance.

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heavy gauge steel, accurately machined for close-tolerance fit with the cast iron, drip proof end bracket. Base is welded to the frame and the bottom is milled for solid mounting and accurate centering.

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Know Standards for Measuring Equipment Ratings

(*Continued from page 80*)

tube in which the thermometers are placed and a small blower for pulling air over them at the required velocity.

When the setup is complete as shown in Fig. 1, the test unit is started. Adjustments are made until: 1) Air entering the test unit enclosure is 80 F DB, 67 F WB (This is true where the unit is intended for operation inside the conditioned space. When it is to be used outside the space, the temperatures would be maintained at the inlet to the unit); 2) Water is entering the test unit condenser at 75 F and leaving at 95 F; 3) The manometer shown between the unit inlet and outlet reads zero plus or minus 0.005 in. of water at the desired conditioned air quantity.

TABLE I — MAXIMUM CONTINUOUS OPERATING CONDITIONS AND HIGH AND LOW VOLTAGE TESTS

Air Conditions

Air temperature surrounding unit: 95 F DB, 71 F WB

Air temperature entering unit: 95 F DB, 71 F WB

Air quantity, cfm/1000 rated cooling units: 33.3

Condenser Water

Water temperature entering condenser: 80 F

Water temperature leaving condenser: 100 F

Voltage

Tests should be run at 90, 100, and 110 percent of rated voltage at unit service connection and at rated frequency. The voltages should be maintained at the specified percentages of rated potential under running conditions and no adjustments should be made for the starting test.

Duration of Test

Continuous for four hours after equilibrium of surrounding and entering air conditions and equilibrium of condenser water temperatures have been established, ten second shutdown, then resumption of normal operation for one additional hour.

Requirements

Air conditioner motors should operate continuously under specified conditions for the first four hours of the test without interruption caused by tripping of motor overload protective devices and without damage to motors due to overheating. After completion of the four-hour run, motors should be stopped for ten seconds and then current restored. Upon reapplication of power, the unit should immediately restart and continue running for one hour without operation of motor overload protective devices and without damage to motors due to overheating.

City Water

Units should be capable of operation under these maximum conditions at a water pressure drop of 25 psi, measured across the unit, including the water regulating valve, with the water valve set to close at a condenser temperature of 90 F.

Seven Sets of Readings

Test conditions are maintained by making adjustments until equilibrium is reached (but at least 1 hr of running time). Data is then recorded every 10 min for 1 hr giving seven sets of readings. Among the data recorded are the following: 1) date; 2) name of observers; 3) barometric pressure; 4) fan speed of test unit; 5) voltage and frequency applied to each motor; 6) power input to each motor; 7) DB and WB temperatures of air entering the unit, and DB and WB temperatures of air entering the enclosure; 8) DB and WB temperatures of air discharged by the unit; 9) DB and WB temperatures and pressure at nozzle; 10) Flow rate of condenser water; 11) temperatures of water entering and leaving the condenser; 12) pressure difference between cooling water inlet and outlet (without water regulating valve and with valve set to shut off at 90 F condensing temperature); 13) air static pressure difference between air inlet and discharge of unit.

Standard 16-53 details the procedure for obtaining most data and also the accuracy with which it must be taken. Well defined equations are given for calculating capacities.

For a self contained water cooled air conditioner, capacity is determined from both the conditioned air flow measurements and the condenser water flow and power measurements.

(*Continued on page 89*)

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FULL DIMENSION COMFORT

... winter and summer

No matter what the temperature outside, it's always comfortable inside when you use Standard's Ceiling Air Diffusers. They supply gentle, full dimension warm air heating in the winter, and cool comfort air conditioning in the summer.

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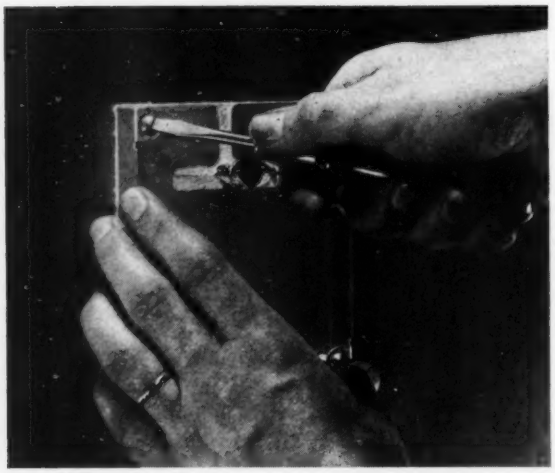
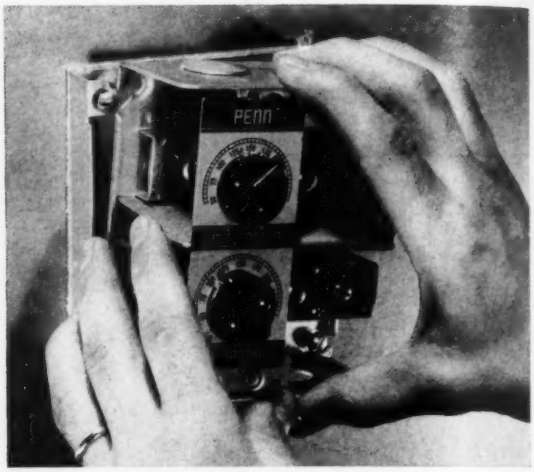


1. Cut 1¼" power element hole. Drill 2 mounting holes, using asbestos seal as template. Start mounting screws through bracket.



2. Insert power elements and hook slots in control case under screw heads, then tighten screws.

3. Place control cover in position and secure 2 retaining screws. That's all you do . . . it's simple and fast.

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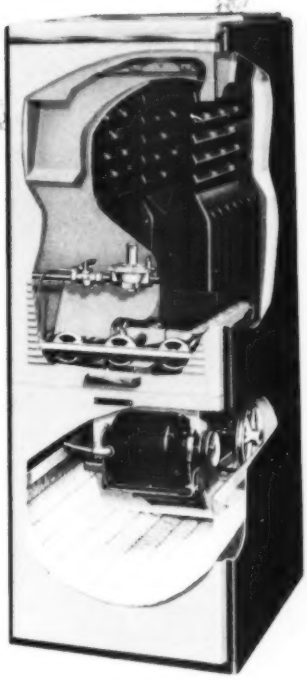

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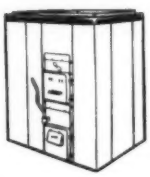
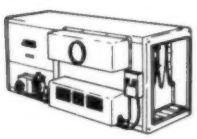
- The finest, most complete sales and service training program teaches your men the latest techniques to increase *your* sales volume.
- Proven new-business development ideas . . . real, two-fisted selling tools . . . to get extra heating and air conditioning sales.
- A special, tailor-made promotion kit to help *your* builders sell more houses.
- Nationwide branch office engineering service that places expert heating and air conditioning technicians at *your* disposal—whenever and wherever you need them.
- Largest consistent advertising program . . . tells *your* prospects about *your* products and services.





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- Ft. Madison Tin & Fce. Co., Ft. Madison, Ia.
- Nelson Tin & Fce. Wks., Council Bluffs, Ia.
- Johnson Sheet Metal Shop, Albert Lea, Minn.
- Schwickert Hdwe., Mankato, Minn.
- Diedrich & Co., Fond du Lac, Wisc.
- Droegkamp Fce. Co., Milwaukee, Wisc.
- Sell Bros. Hdwe. Co., Wausau, Wisc.
- Geo. Groh & Sons, Emporia, Kan.
- Standard Plbg. & S. M. Co., Manhattan, Kan.
- L. J. Egan Tin Shop, El Dorado, Kan.
- Ekern Home Equip. Co., Flandreau, S. D.
- Valley Plbg. & Htg. Co., Valley City, N. D.
- Johnson Furnace Co., Kansas City, Mo.
- Green Furnace & Plbg. Co., Lincoln, Neb.
- Simon Bros., North Platte, Neb.
- Rinehart & Son, Rushville, Ill.
- A. J. Rodolf, Mt. Sterling, Ill.
- Ports Bros. Hdwe. Co., Polo, Ill.
- Wise Sht. Mtl. Shop, Kirkwood, Ill.
- Althoff Hdwe., West McHenry, Ill.
- A. C. Heise, Lamar, Colo.
- Joe Voto Hdwe., Clinton, Ind.
- C. W. Snyder & Co., Waynetown, Ind.
- F. B. Neyhart Htg. & Plbg., Greentown, Ind.
- V. E. Bell & Sons, Inc., Durham, N. C.
- McLester's, Inc., Rockingham, N. C.
- T. R. Driscoll Sheet Metal Works, Lumberton, N. C.
- Piedmont Sheet Metal Co., Winston-Salem, N. C.
- K. W. Arthur & Son, Salisbury, N. C.
- Cranfill Frey Co., Lexington, Ky.
- Starbuck Bros., Salem, Ohio
- H. L. Hallett & Son, Shadyside, Ohio
- Dickens Metal Shop, Fostoria, Ohio
- A. Smith & Sons, Hicksville, Ohio
- Hanover Iron Works, Wilmington, N. C.
- Stanley Paitson, Terre Haute, Ind.
- C. A. Schu and Son, Carlisle, Ind.
- C. W. Loesch & Son, Columbus, Ind.
- Emery E. Craver, Cortland, Ohio
- H. C. Younkins, Grove City, Pa.
- John L. Rausch, Wayland, N. Y.
- Harry Badger, Bellefonte, Pa.
- H. C. Orebough, Newport, Va.
- W. H. Bodine, Bellows Falls, Vt.
- Bacon Bros., Middletown, Conn.
- Merrill Bros., Canton, N. Y.
- Manrow & Nevin, Washington, Pa.
- Kronnenberg, Hamburg, N. Y.
- Marow Bros., Little Valley, N. Y.
- Crose & Leary, Lockport, N. Y.
- Jordan & Haley, Biddeford, Me.
- W. R. Hartin & Son, Columbia, S. C.
- La Mesa Sheet Metal, La Mesa, Calif.
- R. R. Radcliff, Gallup, N. M.
- J. W. Morris Company, Fort Worth, Tex.
- Kerr Sheet Metal, Lufkin, Tex.
- E. H. Carley, Fayette, Ia.

ADDITIONAL NAMES OF 25 YEAR DEALERS WILL APPEAR IN SUBSEQUENT ADS

OK!

I'd like to hear the Lennox profit story. I understand this does not obligate or commit me in any way. But I'm interested in learning just *how* I can profit more—easier—with Lennox.

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

MY NAME_____

in Warm Air Heating, more families buy LENNOX than any other make

THE LENNOX FURNACE COMP

Leaders in home comfort for 60 years

Marshalltown, Iowa • Columbus, Ohio • Syracuse, Fort Worth, Texas • Salt Lake City, Utah • La M Calif. • Decatur, Ga. • Des Moines, Iowa

In Canada: Toronto and Calgary

Standard Methods Rate Equipment Capacities

(*Continued from page 84*)

For a test to be acceptable, the capacities obtained by each of these calculations must agree within 6 percent. The rated capacity of the air conditioner is considered to be the average of the capacities found by the two check methods. Depending upon the data and equations used it is possible to establish a rating for the unit for both the circumstances where it is used within and without the conditioned space. The latter capacity will usually be greater since heat losses from the condensing unit need not be absorbed by the cooling coil but are dispersed to the temperature of the unconditioned air surrounding the unit.

Alternate Method Restricted

We mentioned a little earlier a second means for obtaining unit capacity which we called method B. This method is an alternate for method A in determining the unit capacity from measurements of the conditioned air, but its use is restricted to testing units which are to be installed in the conditioned space. The determination of unit capacity from the condenser water as described as part of method A is the same for method B. Rated unit capacity for the latter method, as for method A, is considered to be the average of the two capacity measurements.

Fig. 2 shows the setup used for method B. The unit is installed in an insulated and vapor sealed room. In order that heat leakage into or from the room will have no effect upon the test data it is necessary either to determine the amount of this heat leakage by test and correct for it in the calculations or to maintain the ambient temperature equal to the room temperature so that there will be no heat transfer.

The room is provided with air treating equipment, as indicated in Fig. 2, which consists of means for heating, humidifying and moving air. It is necessary to independently control and measure the heat supplied to both the heater and to the humidifier. Steam or electricity are the usual heat sources.

During the test the unit is allowed to discharge air freely into the room. To balance the cooling and dehumidifying effect of the unit, the air treating apparatus is adjusted until standard room conditions prevail. After equilibrium at the desired conditions has been established, data is recorded in the manner such as described for method A.

With corrections for the power input to the air treating fan motor, any sampling tube motors that may be used and for heat leakage to or from the test chamber, the net room cooling capacity is determined from the measurements of the amount of heat and moisture required to maintain the room at the test conditions. Standard 16-53 specifies in detail how the test shall be conducted and gives equations for use in calculating capacity.

The rated capacity of an air conditioner will not be a function of the rating method used provided industry recommended procedures are followed. If they are not, rating information is not defined and has true significance only to the manufacturer of the equipment.

The air conditioning dealer or contractor may find himself in an untenable position in this discussion since he might someday be the initiator of demands upon certain manufacturers to produce equipment with "competitive" ratings. If these demands can be met only by falsifying facts, the dealer, although he may have achieved possible temporary relief in being able to sell more equipment, might eventually find that he is in trouble with his customers because the units will not produce as claimed. In his own best interest, therefore, the dealer should want to be informed as to how air conditioners should be properly rated. If he demands accurate ratings from his own supplier and from his competitors, any trend which might develop toward "over-optimistic" ratings would be reversed and the air conditioning industry will be spared a possible embarrassing day of reckoning.

Stainless Steel Tower Provides Beauty, Utility

WHEN AIR CONDITIONING was installed in the Irving Trust Co. building at Number One Wall St., New York City, the cooling tower called for in the specifications presented a problem of appearance, since it adds about 30 ft to the height of the building, which is 50 stories high and a rather impressive landmark in the Lower Manhattan area. Because of its prominence, the cooling tower had to present the best possible appearance.

The demand was met by chromium-nickel stainless steel sheathing, which filled the bill from both beauty and utility standpoints. It was chosen for internal structural parts — including columns, tie rods, collecting basin and the steel supports which carry the redwood filling — for reasons of long range economy, to minimize maintenance expense over the years. Both of these advantages, of course, result from the material's well known resistance to rust and tarnish. The tower is constructed entirely of 18-8 stainless steel and measures about 25 × 40 ft.

BUSINESS IS PROFITABLE

with ®Janitrol quality

Don't sacrifice your profits or reputation on "bargain-basement" brands! These gas-fired Janitrol Winter conditioners assure fewer call-backs, less servicing and greater customer satisfaction.

THE VERTICAL UP-FLOW

Always your best-seller for either new homes or modernization. Your choice of two models, either the famous Dura-tube design (with practically indestructible heat exchangers) or the Pace-setter model (popularly priced). They're compact and attractive . . . completely accessible from front. Extra quiet for installation close to living areas. 10 models 60,000 to 120,000 Btu/hr. input.

ALL-NEW DOWN-FLOW

Designed specifically for perimeter-type systems used in many of the new, basementless homes. Approved for reduced clearance and closet installations. High capacity blower permits use with small duct systems. The elevated burner assembly is above floor dust and dirt. Easy front access to all parts and controls. Available in 80,000, 100,000 and 120,000 Btu/hr. inputs.

HORIZONTAL SPACEMAKER

Gives you unusual flexibility. Installs suspended or on the floor in attic, crawl space, garage or basement. Adaptable to all distribution systems . . . conventional, perimeter or radiant. Easy access from either side. This model also gives top performance as a commercial-industrial unit heater. Filters are optional. Four sizes, from 65,000 to 150,000 Btu/hr. input.

THIS HEATING HEART MAKES THE DIFFERENCE

EXCLUSIVE • AMPLI-FIRE RIBBON BURNERS

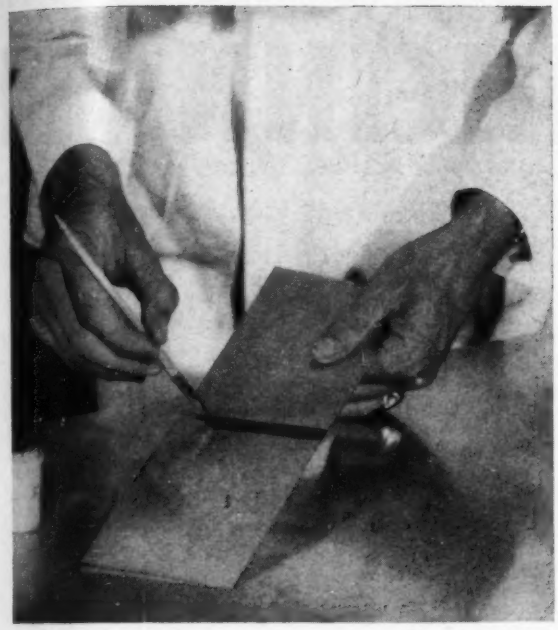
Intense heat from a quiet, clear blue ribbon of flame is accurately centered below each heat exchanger tube. This burner assembly is easily removed without disturbing pilot, manifold or piping. The non-rusting, alloy burner ports are cleaned in just a few seconds.

EXCLUSIVE • MULTI-THERMEX HEAT EXCHANGERS

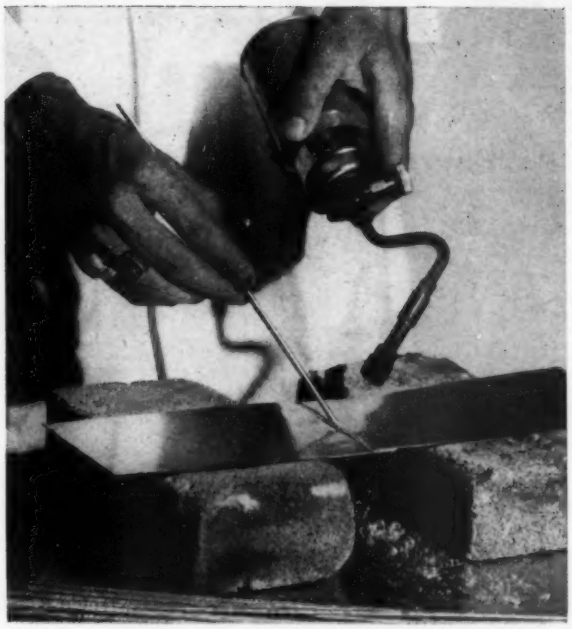
Every furnace has several of these welded, die-formed steel exchangers that give extra heat transfer area . . . maximum heat extraction. This results in faster heating, higher efficiency and greater durability. Since 1940, Multi-Thermex replacements, for any cause, have been less than ¼ of 1%!

®Janitrol
HEATING AND AIR-CONDITIONING
DIVISION

Surface Combustion Corporation, Columbus 16, Ohio
In Canada: Alvar Simpson Ltd., Toronto 13.



SOLDERED JOINT should be painted with moisture-proof lacquer or paint if it is to be exposed to moisture. High zinc content is desirable in solder under these circumstances



HEAT IS APPLIED to the work rather than to solder or flux. Non-oxidizing flame is used and area should be preheated almost to soldering temperature. Both surfaces should be tinned

Basic Understanding of Properties Provides

Simplified Aluminum Soldering

Familiarity with heat conducting properties together with the special solders and fluxes now available make soldering techniques little different from those you're accustomed to using on other metals

By G. W. Birdsall
Reynolds Metal Co.

THE WORKMAN who is equipped with a few elementary facts will find soldering procedures for aluminum fundamentally the same as the principles he uses for steel, brass, copper or tin.

A basic difference is in the heat range, which is 550 to 700 F for aluminum, whereas most other soldering is done at 375 to 400 deg. For joining very small parts which can be heated easily, a soldering iron will do the job; for larger pieces, a torch is recommended, especially when it is impossible to heat the entire piece to working temperature and hold it there during the soldering operation. Overall heating of larger pieces is most desirable because of the high heat conductivity of aluminum which causes heat to flow away from the working area. The practical size limit for easy joining with a torch is about 20 sq in. Larger pieces present a problem of possible distortion because of rapid heat dissipation. Development work is underway to extend this practical size range.

Oxide Coating Must Be Removed

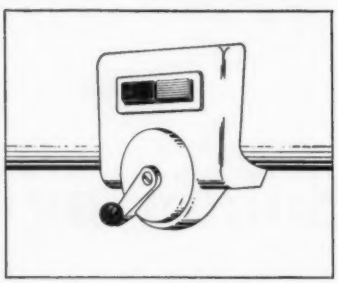
Because of the great affinity of aluminum to oxygen, an oxide coating immediately forms on the surface when it is exposed to air. This coating must be removed because solder will not bond to it. Removal is accomplished by either of two recommended methods:

(*Continued on page* 96)

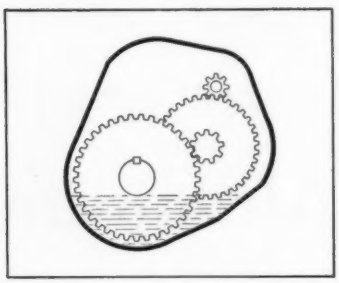
2 New CINCINNATI PRESS BRAKES

THIRTY TON - - - - - 2-30 SERIES
FIFTY TON - - - - - 3-50 SERIES

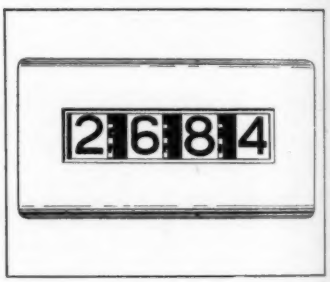
COMPETITIVELY PRICED



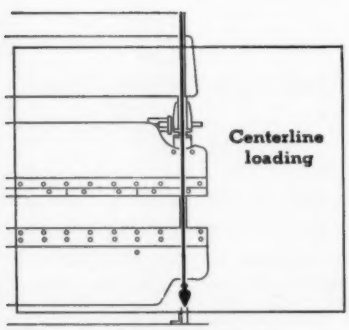
Front controlled, variable speed drive, 20 to 50 strokes per minute.



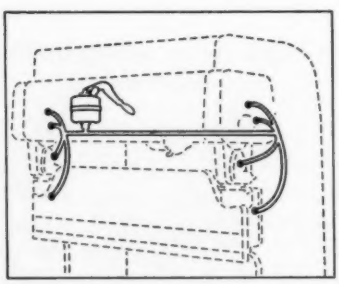
Completely enclosed transmission, running in oil.



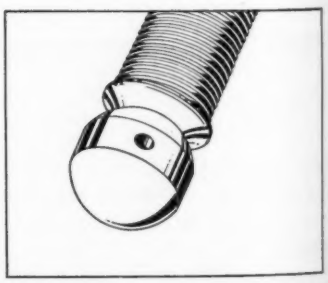
Two micrometer indicators, one at each end of the ram—easy to read and accurately record the amount of adjustment and tilt.



Centerline loading prevents weaving of the housings and insures accurate bends.



Centralized pressure lubrication system.



Ball end on the ram adjusting screws permits tapering of the ram for fade-out work.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

2-30 SERIES

This new 2-30 Series Cincinnati All Steel Press Brake has a capacity of 14 gauge x 6′ mild steel.

Look at these unusual standard features:

2½″ stroke—12″ shut height—9″ throat.

Distance between housings 5′-2″—overall die surface, 6′-0″.

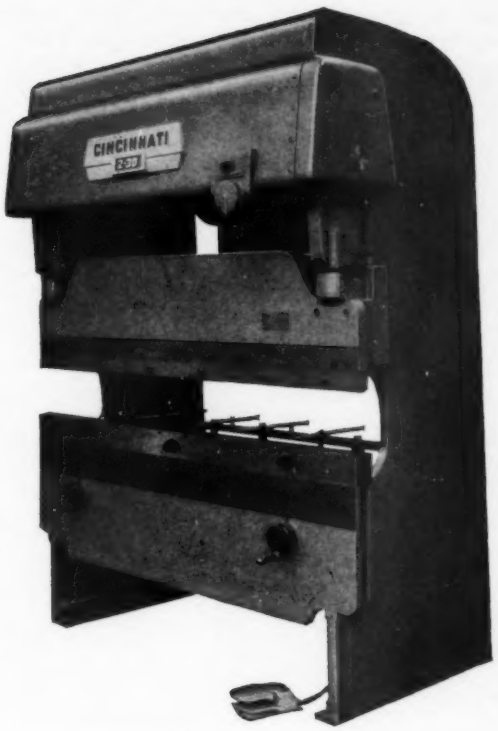
Front controlled, variable speed drive, 20 to 50 SPM. 4″ manual ram adjustment including ram tapering adjustment for fade-out work (power adjustment available as extra feature).

Bronze swivel end-guide bearing for accurate endwise alignment, even when tilting ram.

Brushless electro-magnetic brake and clutch.

Deep bed and ram, planed and drilled for 5¾″ angles.

Micrometer indicators on both ends of ram for fast, accurate setting.



3-50 SERIES

These new 3-50 Series Cincinnati All Steel Press Brakes are built in two lengths and have a capacity of 10 gauge x 6′ mild steel. Investigate these unusual standard features: 3″ stroke—12″ shut height—12″ throat—distance between housings 6′-6″ or 10′-6″—overall die surface 8′-0″ or 12′-0″—front controlled, variable speed drive, 20 to 50 SPM.

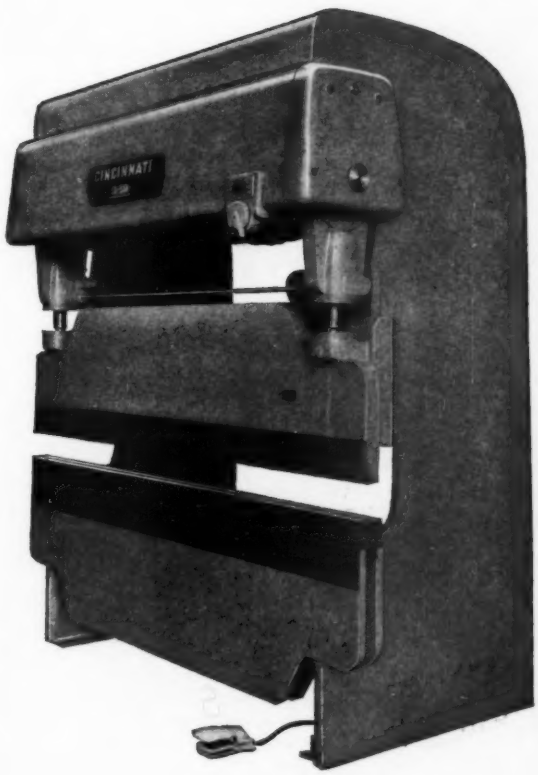
5″ motorized ram adjustment, including ram motor and control, complete with ram tapering adjustment for fade-out work.

Bronze swivel end-guide bearing for accurate endwise alignment, even when tilting ram.

Brushless electro-magnetic brake and clutch.

Deep bed and ram, planed and drilled for 5¾″ angles.

Micrometer indicators on both ends of ram for fast, accurate setting.



This advertisement to Builders makes an important point for Heating Contractors, too. It appears in September HOUSE & HOME, October PRACTICAL BUILDER, November AMERICAN BUILDER

TWO-FAMILY HOUSES, TOO...

"ENGINEERED FOR YEAR-ROUND AIR CONDITIONING"

Heating Contractor for these homes by Contractors & Builders, Inc., is Robinson Furnace Company, Chicago. Here is the Robinson installed dual furnace system with all ductwork Reynolds Aluminum.

...with rustproof ducts of

REYNOLDS ALUMINUM

The Skokie Development by *Contractors & Builders, Inc.*, Chicago, features two-family houses simple in design but modern in layout and conveniences. And important in their sales points is an air-conditioned future... already engineered into the heating and duct system.

That means the ducts are aluminum—rustproof Reynolds Aluminum. When the time comes to put cooled air through these ducts, you know there's likely to be moisture condensation. But you know moisture can't hurt the ducts.

More and more builders are promoting this feature. And Reynolds backs the promotion with intensive advertising to homebuyers ...national magazine ads and important TV advertising. Take advantage of it. Sell future air conditioning. And identify your ducts as aluminum—Reynolds Aluminum.

SIGNS FOR YOUR BUILDING SITES AVAILABLE...CONSUMER LITERATURE FOR DISTRIBUTION. ALSO "Designed in Aluminum" SEALS FOR IDENTIFICATION. Write to REYNOLDS METALS COMPANY, General Sales Office, Louisville 1, Kentucky.

REYNOLDS ALUMINUM

Now only Lima diffusers have *BOTH*

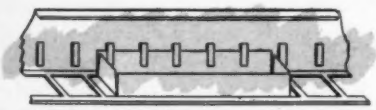
Pre-cut Boot Openings and Automatic Pushbutton Damper

Lima Series 70 with damper

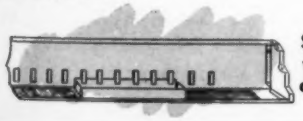
Push in—damper automatically opens and locks. Push up — it automatically snaps closed. Turn pushbutton screw with fingers to balance.

Series 75 without damper for economy installations.

NEW, EASIER INSTALLATION



Base of diffuser has pre-cut openings separated by removable ⅜" mullions, allowing boot to be located any place in bottom of diffuser. Boot fastening clips stamped in back section hold boot in place. Pre-cut openings eliminate cutting and save considerable time and expense.



Steel strip furnished with unit to seal openings not used.

- ***Automatic Pushbutton Damper Control*** gives fingertip control of air in heating and cooling, with positive air shut-off.
- ***Easier Installation*** with new pre-cut boot openings in base—saves considerable time and expense.
- ***Efficient Air Diffusion*** over wide area assures complete indoor comfort and induces imperceptible recirculation of room air. Correct vertical angle prevents air from striking room occupants or scrubbing wall.
- ***Modern Styling*** with horizontal louvers that harmonize beautifully with horizontal lines of floor, baseboard and window. Permanent medium Beige finish. Does not require re-painting unless desired.
- ***Ideal for Cooling*** in new or existing installations. Double spring tension on full length damper eliminates rattling and keeps valve from blowing shut due to higher air velocities.
- ***New Series 75 For Economy Installations*** is identical with Series 70 but without damper and automatic pushbutton control, for use where damper is not required.

Now Lima has everything you want in a baseboard diffuser . . . for heating and cooling jobs. Check the Lima Baseboard Diffuser, feature by feature, and you'll find that Lima is your best buy for economical heating and cooling installations that assure complete customer satisfaction.

See your Lima jobber or write direct for new literature and prices on Lima Perimeter Extended Baseboard Diffusers.

Lima REGISTER CO.
Lima, Ohio

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION
MODERN COMFORT

Distributed Exclusively By Heating Wholesalers And Manufacturers.

Special Solders Simplify Aluminum Work

(*Continued from page* 91)

AVOID OVERHEATING when flux is used — flux forms a hard crust when heated above 750 deg. In flow method, flux dissolves oxide coating. Keep melted flux at lower temperature than the solder.

SOLDER IS APPLIED to the surface while abrading is done with wire brush. With the friction method the oxide coating is removed and soler keeps it from re-forming by preventing air exposure

Most widely used is the *flow method*, which makes use of a flux specifically designed for aluminum. The flux removes the oxide coating and keeps it from reforming while the solder bonds with the underlying aluminum.

No flux is used in the *friction method*. Instead, a wire brush or toothed tool is employed to remove the coating. Rubbing the soldering iron or the solder against the surface accomplishes the same results.

RECOMMENDED SOLDERING METHODS

1. *The flow method* — Specially designed aluminum flux removes oxide coating while solder bonds with the aluminum

2. *The friction method* — Wire brush, toothed tool or soldering iron are used to remove the oxide coating. Surface should be covered with solder during oxide removal

The surface to be tinned should always be completely covered with molten solder while removing the oxide. Additional oxide cannot form on a surface which is not exposed to the air.

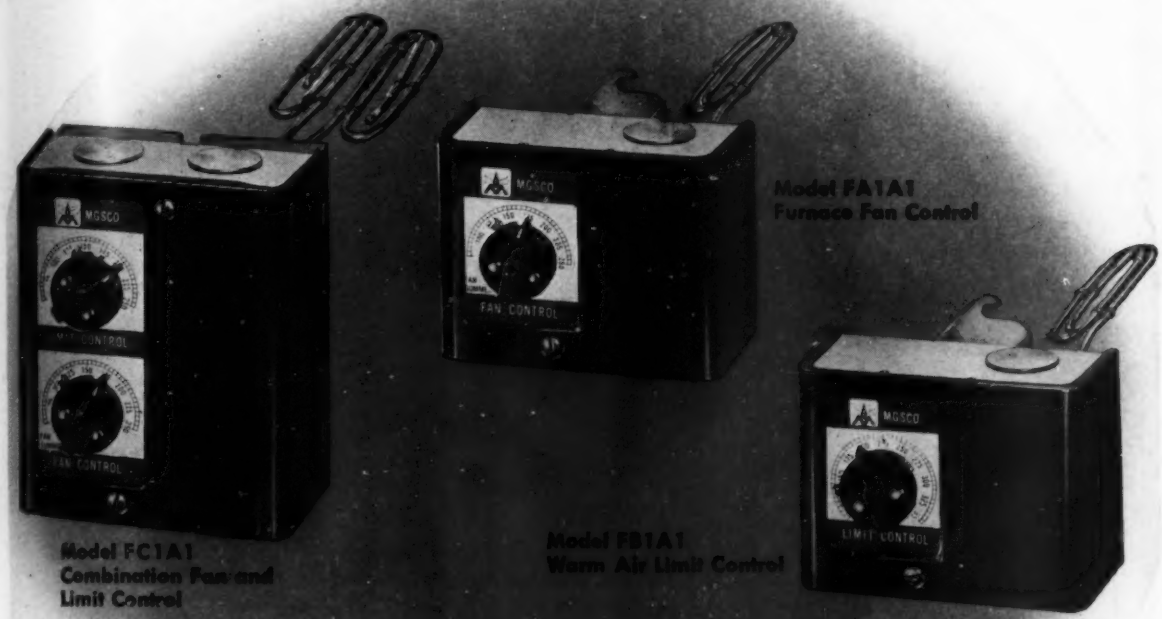
Both surfaces to be joined should be tinned and then joined together in the usual manner, keeping the surfaces clean and free from grease. Apply enough heat to the metal to melt the solder. For additional heat, the torch can be applied to the underside of the work. Avoid applying heat directly to the solder or flux. When the working temperature has been reached, the flux will fume and the solder will flow freely. The flux used should be melted at a lower temperature than the solder so it will be replaced by the solder and will not remain in the joint. Any flux left after soldering should be removed completely to avoid the possibility of corrosion.

Solder Must Be Designed for Aluminum

Aluminum solder is available in either stick or wire form. The usual composition is at least 50 percent tin, the remainder being zinc. A solder containing 60 percent tin and 40 percent zinc is frequently used. Solders with a wide range of melting points are now generally available; be sure to use a solder designed for aluminum.

Care should be taken in soldering aluminum to prevent electro-galvanic action, which occurs when two dissimilar metals come in contact in a solution which conducts electricity. Without moisture there can be no such action. If the joint is to be exposed to moisture, using a solder with a greater zinc content would tend to minimize this reaction. The joint to be exposed to moisture can also be protected with moisture-proof lacquer or paint.

A COMPLETE LINE OF FAN AND LIMIT CONTROLS FOR WARM AIR FURNACES...



Model FC1A1
Combination Fan and Limit Control

Model FA1A1
Furnace Fan Control

Model FB1A1
Warm Air Limit Control

...LATEST ADDITIONS TO MGSCO's EXPANDING LINE OF GAS CONTROLS

Now you can order all your gas control requirements from one manufacturing source.

Note the outstanding plus values of these MGSCO fan and limit controls:

- **Accurate Operation** is provided by trouble-free liquid expansion power elements. Settings will not change over temperature range of the control.
- **Mounting Flexibility** ... reliable operation even close to the heat exchanger without need for special precautions. May also be mounted in any position without affecting accuracy.
- **Compact** ... flexible elements permit "tight-spot" location.
- **Not Affected by Radiant Temperature** due to "engineered" design of elements.
- **Dust Proof** ... contact unit enclosed in special enclosure.
- **Easy-to-Read Dial** ... calibrated dial shows settings directly. Adjustable stops to change settings.

Use these reliable MGSCO fan and limit controls in your designs. They are a functional and sales asset to your line of gas products. These quality units require minimum attention in the field, a real time and money saver for you.

Consult with our engineers on your problem.

Why Not Order the Controls you Need from this Handy Table?

Model Number	Control	Cut-Out Setting		Cut-In Setting		Differential		Adjustable Stop	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
FA1A1	Furnace Fan Control	75	235	90	250	15	65	125	250
FB1A1	Warm Air Limit Control	120	350	100	330	20	85	200	350
FC1A1	Combination Furnace Fan	50	235	65	250	15	65	80	250
	Limit Control	65	250	50	235	15	65	80	250

Control	A.C. Motor Ratings				A.C. Non-Inductive		Pilot Service	
	115 v.		230 v.		115 v. (Amp.)	230 v. (Amp.)	a.c. 115 or 230 v.	d.c. 115 or 230 v.
	Full Load (Amp.)	Locked Rotor (Amp.)	Full Load (Amp.)	Locked Rotor (Amp.)				
FA1A1 FB1A1 FC1A1	7.4	51	44.6	30.6	12.9	6.9	125 v.a.	57.5 v.a.

Write us for the Complete Specifications

MILWAUKEE GAS SPECIALTY CO., Dept.AA-2, Milwaukee 1, Wis.

snug...

as automatic heat by HEIL

The famous bug in the rug has nothing on comfortable Heil automatic heat owners, who rely on their dependable Heil units for steady, even warmth from floor to ceiling!

Heil *sellers,* too, are feeling snug these days. They're confident that Heil advertising is drumming up added prospects . . . that the HEIL-designed and HEIL-built units they sell operate at peak performance longer and with less service . . . and they know they can depend on Heil wholesalers to help them operate more profitably.

They're secure, also, in knowing that they handle a line with this scope:

OIL FURNACE-BURNERS
BTU Capacities from 80,000 to 224,000
- 6 Lo-Boy Units
- 2 Hi-Boy Units
- 1 Counterflow
- 4 Horizontal Units

GAS FURNACE-BURNERS
BTU Capacities from 60,000 to 200,000
- 6 Lo-Boy Units
- 2 Hi-Boy Units
- 1 Counterflow
- 5 Horizontal Units

OIL BOILER-BURNERS
BTU Capacity from 93,000 to 252,000
- 6 Different Units

GAS BOILER-BURNERS
BTU Capacities from 75,000 to 200,000
- 6 Different Units

CONVERSION GAS BURNERS
BTU Capacities from 300,000 to 400,000
- 3 Different Units

CONVERSION OIL BURNERS
BTU Capacities from 147,000 to 592,000
- 4 Different Units

SUMMER AIR CONDITIONERS
- 8 Console Units: 2 or 3 Compressor H.P. 24,00 to 36,000 BTU Capacities
- 4 Horizontal Units: 2 or 3 Compressor H.P. 24,000 to 36,000 BTU Capacities

Why don't you start selling Heil, and start feeling snug, too!

Write direct for more information on the fast-selling Heil heating and cooling line. Write, too, for important information concerning territories available.

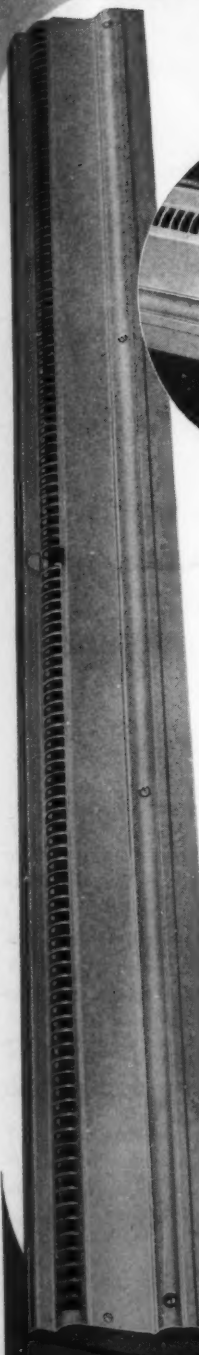
The Heil Co. is a member of OHI, GAMA and an associate member of NHWA.

THE HEIL CO.

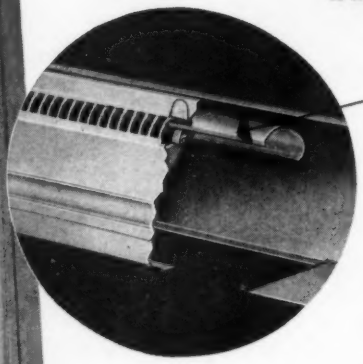
MILWAUKEE, WISCONSIN **HILLSIDE, NEW JERSEY**

SALES OFFICES: New York, N.Y.; Union, N.J.; Atlanta, Ga.; Cleveland, Ohio; Chicago, Ill.; Milwaukee, Wis.; Kansas City, Mo.; Denver, Colo.; Dallas, Texas; Los Angeles, Calif.; Seattle, Wash.

THESE 4 GREAT UNITS
FILL EVERY PERIMETER REQUIREMENT!



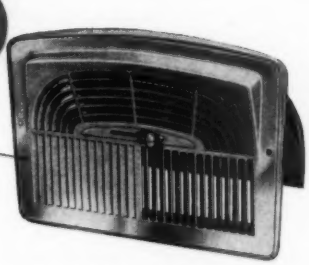
1 AIR CONTROL No. 188 baseboard perimeter DIFFUSERS WITH THE NEW ROTARY DAMPER



Here it is — the finest baseboard diffuser on the market! For heating or cooling it can't be beat. It's got everything! The new, exclusive, built-in **ROTARY DAMPER** is now an integral part of the face . . . maintains a constant air pattern and uniform velocity at any degree of opening, silent at any setting, easily balanced at the face.

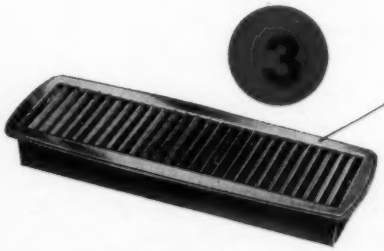
New **ADJUSTO-BOTTOM** cuts installation time to the minimum. Simply slide bottom panel out to match duct location, snip off the excess and insert into other end of the diffuser and complete the installation. Made in 4 ft. and 2 ft. lengths.

2 No. 15 SIDEWALL DIFFUSER



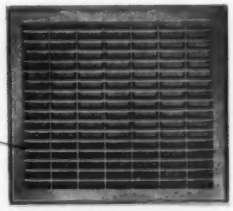
Smart appearance plus unique flared face design combine to make this the ideal unit for sending a blanket of warm or cold air over outside walls without annoying drafts. Balancing damper easily adjusted right at the face. Matching adapter frame permits convenient mounting of the No. 15 as a baseboard diffuser, too.

3 No. 42 FLOOR DIFFUSERS



Handsomely styled seamless one-piece face with new, extra-wide flanges to insure complete coverage of rough cut or irregular floor openings. Wafer thin valve and smoothly curved adjustable vanes permit positive control of air stream with a minimum of resistance. Easily balanced at the face. Available in four popular sizes.

4 No. 333 RETURN AIR GRILLES



The perfect answer to problem of centralized returns. Rugged, low-cost and good looking — available in a wide range of sizes. Easily installed in ceilings, walls or doors. Other styles include the new baseboard grille, No. 186, companion to the No. 188 diffuser described above.

THERE'S AN AIR CONTROL GRILLE, REGISTER OR DIFFUSER TO [illegible] EVERY HEATING AND COOLING REQUIREMENT. SEND IN TODAY FOR BULLETIN ON COMPLETE PERIMETER LINE No. 146-AC.

Air Control PRODUCTS, INC.
DEPT. A. COOPERSVILLE, MICH.

MODERN SCHOOL buildings demand special heating treatment, in this case met by two oil fired furnaces which supply warm air through embedded ducts

School Heating Problems Solved

. . . with convection panel systems in one story, slab-on-grade buildings which utilize two or more warm air furnaces to warm slabs and to heat and ventilate classrooms, halls and offices by convection from perimeter outlets

By Fred S. Dubin
Fred S. Dubin Associates
Consulting Engineers

THE IDEAL heating and ventilating system must supply heating and cooling and also complete comfort. In addition, for schools the system should take the following into account, as desirable features:

1) Adequate temperature control.
2) Humidity control.
3) Air filtration: freedom from dust and pollen.
4) Outdoor air and ventilation.
5) Odor control.
6) Uniform temperatures from floors to ceilings, with warm floors especially important to kindergarten and lower elementary grades.
7) Uniform temperatures from outside walls to room interiors.
8) Germicidal treatment of the air.
9) Quiet operation.

As the initial cost of the system in most schools must, of necessity, be tailored to fit "tight" budgets, so also operating and maintenance costs must be as low as possible. Therefore, simplicity of operation is an important factor.

Ideally, too, the heating and ventilating system should be integrated with the building structure to effect any possible reduction in the general building costs. Also, it is desirable to have the system concealed from view as far as possible, and consume a minimum of space.

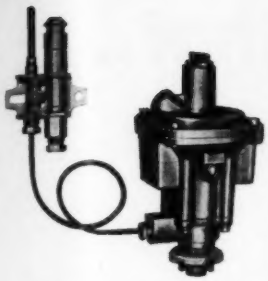
Variations of warm air heating or warm air panel heating possess features meeting these qualifications.

School authorities in Connecticut had to be convinced that warm air heating should be used. Complete plans and specifications for a warm air panel heating system for a particular school were presented, and after several conferences between the engineer, architect and state board of education authorities it was decided to install a modern forced warm air panel heating system in a new elementary school. Since then, the system has been installed in several schools, ranging in area from 8000 sq ft to 64,000 sq ft.

Warm Air and Slabs Heat Rooms

All of the schools are one story slab-on-grade construction. Two or more direct fired oil furnaces blow warm air through ducts embedded in the floor slab. The slabs are warmed to a temperature of 70 to 74 F. The warm air is ultimately discharged directly into each room — at 70 to 120 F, depending on the weather — along the outside glass walls, either through a continuous grille at counter height behind the

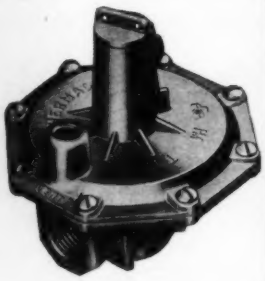
(*Continued on page* 104)



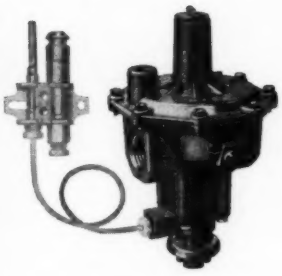
SR-100 Combination Pressure Regulator and Thermo-Electric Safety Pilot. ½". Capacities up to 90,280 B.T.U.

THERMAC

GAS CONTROLS



T-11 and T-15 Appliance Regulators. ½" and ¾". Capacities up to 284,000 B.T.U.



SR-200 Combination Pressure Regulator and Thermo-Electric Safety Pilot. ½" and ¾". Capacities up to 226,200 B.T.U.

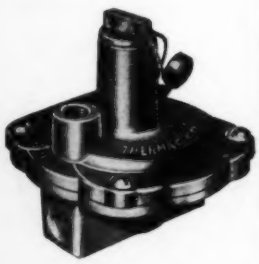
— *finest controls on the market today*

There's no substitute for dependability in a gas control for the proper operation of today's modern automatic appliances. Manufacturers for whom Thermac controls are engineered and built find the following design principles planned into each Thermac product:

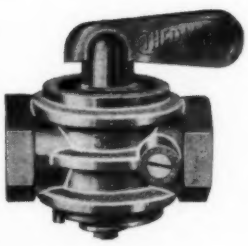
1. Higher B.T.U. capacity, per size.
2. More compact. Easy and less expensive to install.
3. Fewer parts readily accessible without breaking line connections.
4. Dependable in performance and rugged to withstand years of hard service.
5. Finest materials and workmanship. Resistant to corrosion. Trouble free.

Examine any Thermac product thoroughly. Test it. Compare its performance, ease of adaptability, price and quality. Send for recommendations and samples. See how readily Thermac controls fit into your program.

Call Thermac first for immediate delivery.

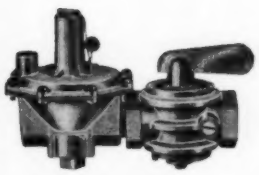


Model TROD Pilot Regulator.



Aluminum Alloy Manual Main Gas Shut-off Valve. Free flow. ⅜", ½", ¾" and 1".

TR-34D-155, T-50, T-60 and T-70 Regulators. ¾" to 2½". Capacities up to 2,160,000 B.T.U.



Assembly of Thermac Gas Shut-off Valve and Appliance Regulator.

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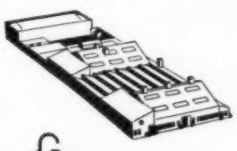

"24 years experience building gas controls."

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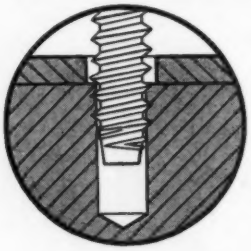
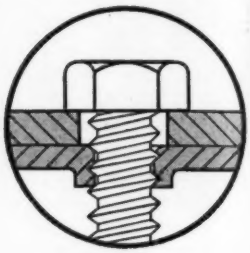
For Sheet Metal Screws that...

Start Right

Drive Right



Seat Right



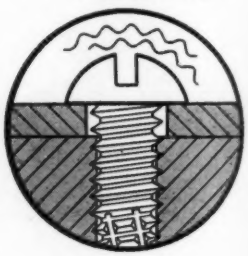
Millions in savings made with P-K Screws since they were originated by Parker-Kalon have proved the Self-tapping Screw *method* reduces assembly costs.

But it takes more than the right method to make sure planned savings pay off. It takes P-K quality standards to guard against defective screws that cause assembly trouble, costly damage to parts, and hidden weakness that shows up in customer complaints.

Only Parker-Kalon can offer P-K quality, the indispensable extra, along with the proved advantages of Self-tapping Screws.

Plan your assemblies for lowest cost . . . a P-K Assembly Engineer will help you. Then make sure *planned* savings *keep on paying off* . . . when you purchase, order "P-K". Parker-Kalon Division, General American Transportation Corporation, 200 Varick Street, New York 14.

Stay Tight



PARKER-KALON®

The First **SELF-TAPPING SCREWS**

originated by P-K . . . and *first* today . . .
the leading choice for fastening economy

Remember P-K means **OK**

SILENCE

IS

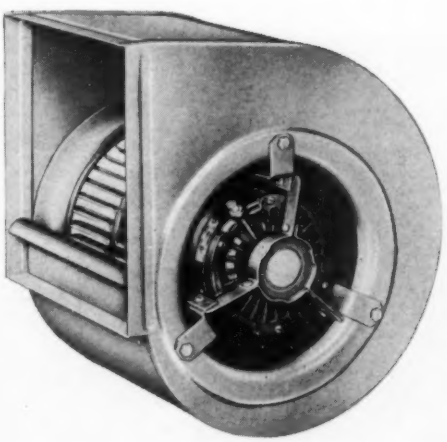
GOLDEN

But perhaps you've heard about it! These days, it's difficult to keep a good thing quiet, unless of course the good thing happens to be Utility's Direct Drive Blower. This silent partner of maximum airflow is equipped with Neoprene hubs which isolate motor noise and vibration. Adaptable to the manufacture of heating, cooling, refrigeration and ventilating equipment, Direct Drive Blowers are designed by Utility engineers to keep things quiet, to make this equipment easier to sell to your customers.

Why not whisper this interesting news to your suppliers. If they'll listen to reason — and that's about the only thing they'll hear with Utility's Direct Drive Blower — you'll easily sell them on the money-making idea that silence is golden — for them and for you.

There's a lot more to the Utility story that also doesn't meet the ear. Utility Direct Drive Blowers take less space, have no unnecessary accessories and can be speed controlled easily. And while Utility's techniques are advanced, costs are not.

Get the maximum sales appeal of silent operation in the equipment you handle. Always check to see that Utility's no-noise Direct Drive Blowers are part of this equipment. Cash in on this "hush-money" with every unit you sell.



A Division of Utility Appliance Corp.

UTILITY FAN CORPORATION

911 East 59 Street, Los Angeles 1, California

you can't match UTILITY *for product and price*

Manufacturers of heavy and standard duty blowers for heating, air conditioning and ventilating installations. Producers of blowers and blower parts for original equipment manufacturers. Write for catalogue data.

Convection Heating Meets School's Demands

(*Continued from page* 100)

wall cases, or through special baseboard registers. Vertical velocities are about 200 fpm, enough to counteract downdrafts.

Vary Amounts of Outdoor Air

The blowers in the furnace operate continuously during periods of occupancy to supply outdoor air, ventilation, and prevent stratification of temperatures in the rooms. Total air change in each room occurs every six minutes.

Outdoor air is introduced evenly to all areas during the daytime in varying amounts, depending on outdoor temperatures, from 10 cfm per pupil when it is 10 F outdoors, to 40 cfm per pupil when it is 60 F outdoors. At night and over weekends, the outdoor air is cut off and all the air is recirculated, the blowers operating intermittently and at reduced speed.

The recirculated air is carried back from each classroom to the central furnace unit, through either a tunnel under the corridor or a plenum space over the ceiling of the corridor. In later installations, it has proved more economical to use the space below the corridor because the same trench is utilized to carry the individual supply feeder ducts to each classroom.

The concrete trench itself forms the return duct. In general, there is an individual supply duct for each classroom passing under the central corridor. At each classroom, four feeder ducts branch off from the main feeder duct and extend to the outside wall, where the air is discharged into the room.

Supply Ducts Not All the Same

In one school, the ducts in the floor are prefabricated round fiber tubes that resist moisture and corrosion and that have been treated for fire resistance. In another school, concrete floor beams with hollow cores from the corridor to the outside walls are utilized as ducts. The corridor trench, which carries the warm air, is divided into nine sections by vertical panels parallel to the length of the corridor. The panels form smooth air passages.

In the trench of another school, 15 in. round fiber ducts to each classroom are insulated with 2 in. vermiculite concrete between them.

Sufficient space is left above the ducts in the trench to permit its use as a return air duct.

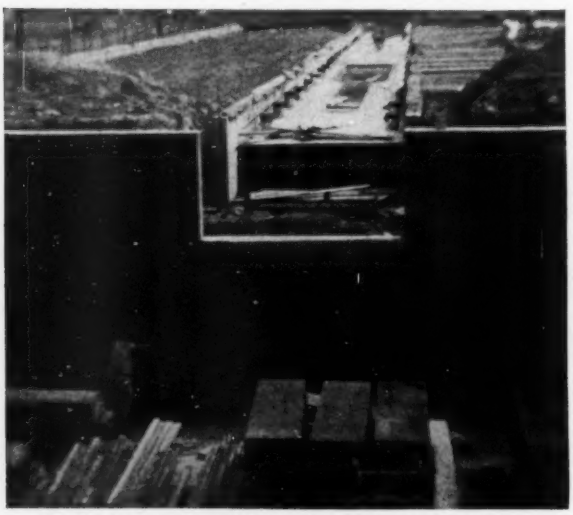
In one campus style plan, no trench was used at all. Return and supply air is carried in ducts under the floor.

Individual Room Control

Each classroom, the gymnasium, and administrative areas have individual room thermostats for individual temperature control. Temperature control is accomplished by manipulation of dampers in the furnace room only, which vary the temperature of air delivered to each room. The total quantity of air delivered to each room is always constant, so that ventilation and air movement is kept at optimum.

The furnace blower is removed from the furnace during installation and bypass ducts are arranged to connect the blower and warm air bonnet. An individual bypass duct connects an individual warm air duct at each furnace.

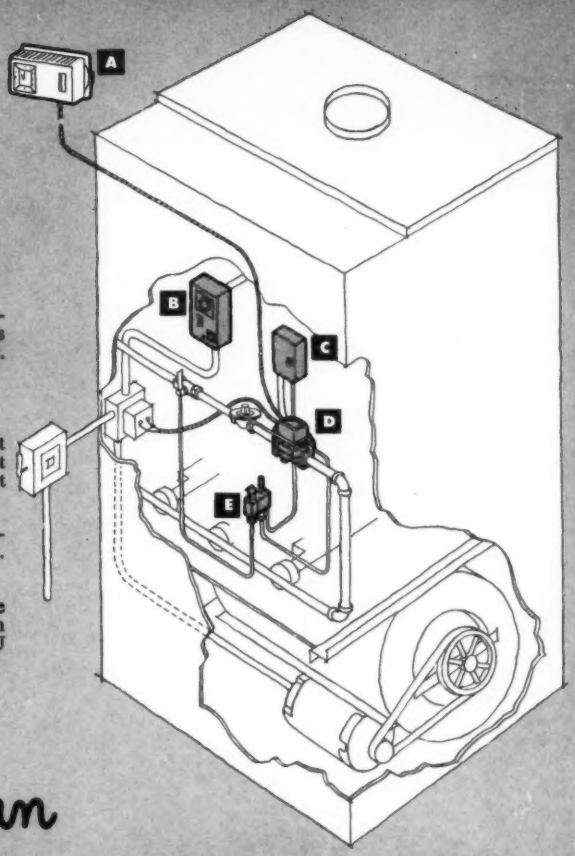
(*Continued on page* 108)



1 CONCRETE TRENCH under central corridor houses supply duct to each classroom and serves as return air duct. Furnace room in foreground is below grade

2 PERIMETER DIFFUSERS and ducts are installed immediately after footings are ready. In some schools, hollow cores of concrete beams are used as ducts

typical all-Honeywell control system



A **Honeywell Chronotherm, TM850,** best-known clock thermostat on the market. Lowers room temperature at night, raises it in morning, at any desired hours, completely automatic. World-famous for accuracy and dependability.

B **Combination Control, L498B.** See description below.

C **Pilotstat, C434,** a reliable, switch-type pilot safeguard. It costs less, it's easy to mount, and its reset button is easy to get at. Use it on furnaces and vented appliances burning street gases. (With LP gases, use C587 or C588.)

D **Gas Valve, V87.** Honeywell's new low-voltage diaphragm valve that provides quieter performance at low cost. Spring-loaded for tight closings. Suitable for *all* gases.

E **Pilot Burner, Q305** a "single-port" pilot . . . the same flame lights the burner and heats the thermocouple which powers the Pilotstat. Less chance for clogging. A low-BTU burner, too . . . saves money for your customers.

Why it's best to use an All-Honeywell Control System

Combination Control, L498B. Easy to mount, easy to read and easy to set. Styled by Henry Dreyfus and designed by Honeywell engineers to provide a small, handsome, and accurate control for furnace fan, plus high limit for burner. In winter, fan-control is automatic and independent of the room thermostat. In summer, your customer uses convenient push-button to control the fan for ventilation.

1. Your installation works better

Every Honeywell control is "system-engineered" to work with other Honeywell controls. This gives you maximum system efficiency.

2. You have the widest choice of controls and systems

Only Honeywell makes control systems for every type of heating plant and for all fuels. When you go all-Honeywell, you get the right system for every job. You're able to rely on *one supplier for all your controls.*

3. You get the best field service in the country

Need help in a hook-up? Puzzled by a performance problem? Your best and nearest answer is your Honeywell wholesaler or branch office. 70 years' experience in controls alone . . . plus the biggest field organization of all . . . puts *more control know-how at your service* from Honeywell than anywhere else in the heating industry.

4. You make more money

You spend less time on service calls, more installing new jobs. And jobs are easier to sell when you tell your customer "I use Honeywell controls throughout." The biggest merchandising and advertising program in the industry means that *Honeywell is the control-name your customer already knows.*

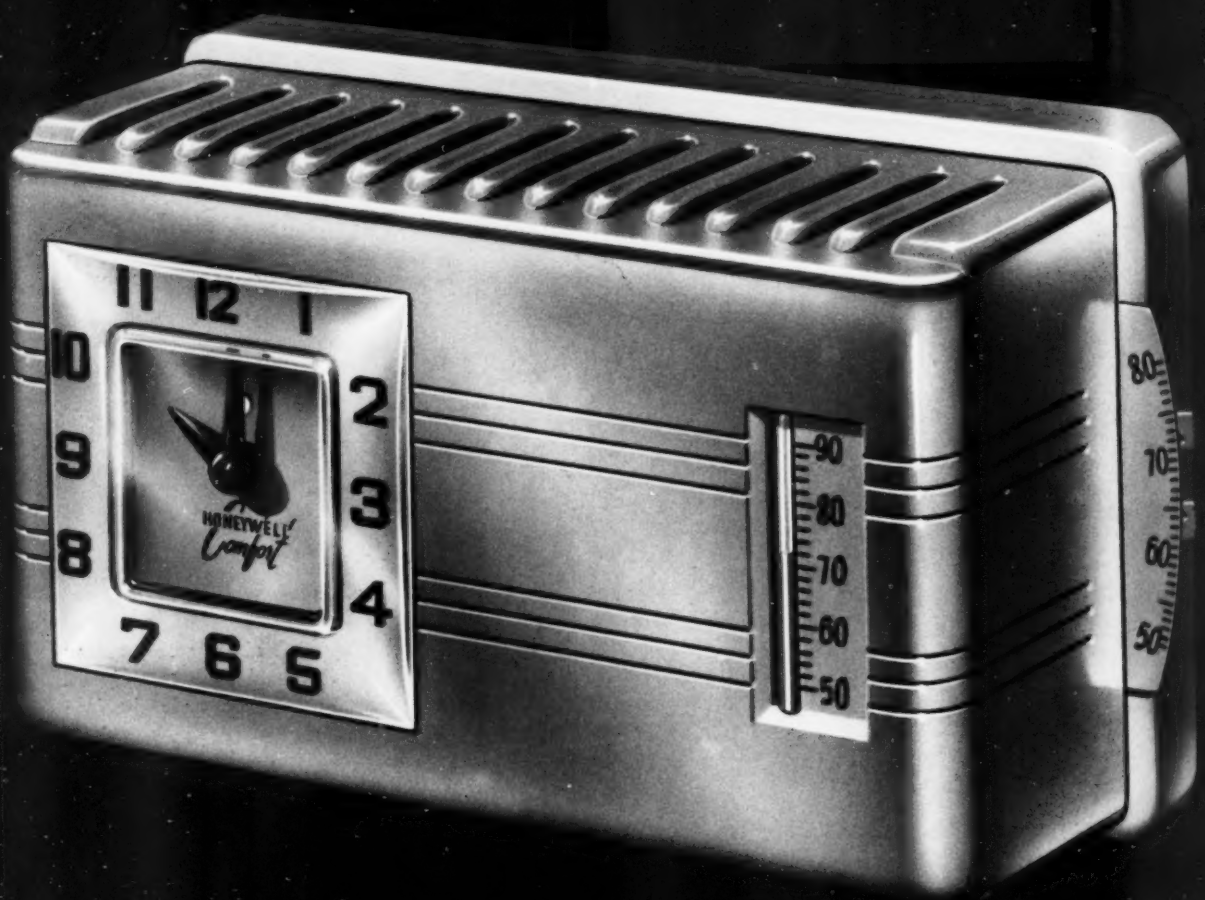
MINNEAPOLIS **Honeywell**

First in Controls

112 OFFICES ACROSS THE NATION

A plus-profit product

for completely automatic heating



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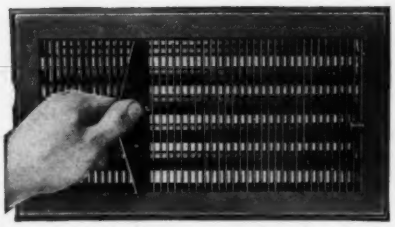
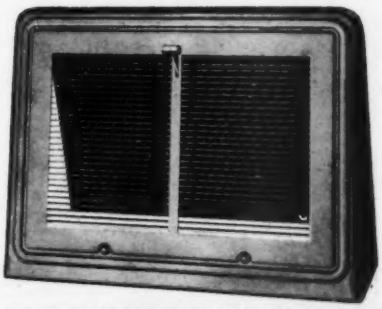
Electric Clock Thermostat

THE RELIABLE "STANDBYS"
that INCREASE Profits for the AIR CONDITIONING CONTRACTOR

THE EFFICIENT, MULTI-VALVE No. 256 U.S. A-C REGISTER

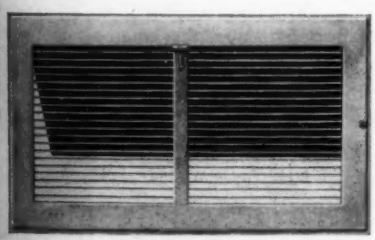


GOING OVER BIGGER and BETTER for Residential and Commercial Heating and Cooling systems. FOUR-WAY CONTROLLED air flow, Non-Vision design, GREATEST LABOR SAVER of all A-C Multi-Valve Registers. Do not be fooled by inferior lines. HERE IS THE BEST in performance appearance and efficiency.



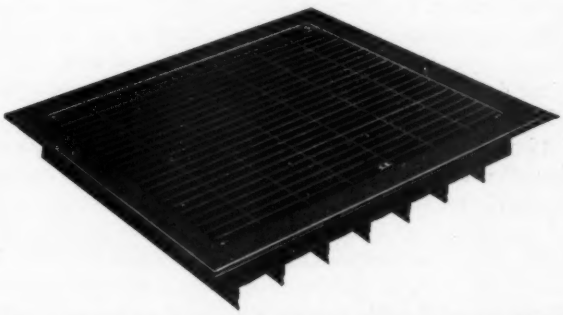
No. 40 U.S. BASEBOARD REGISTER

Your GUARANTEE OF A CLEAN INSTALLATION is the Two Piece Flange Over Frame and Center. ITS POSITIVE SEAL DEFINITELY PREVENTS LEAKAGE, ultimately costs less than old-fashioned one-piece registers. Can be re-set for UPFLOW or DOWNFLOW with Setting Wrench.



No. 153 U.S. AIR CONDITIONING REGISTER

The Best Constructed Single Valve register of all for High Class, Low Cost A-C Jobs. NEAT and ATTRACTIVE, Grille Bars hide interior, can be re-set with Bending Wrench.



No. 400 U.S. TRUSSTEEL FLOOR REGISTER

BUILT LIKE A BRIDGE. No. 400 features efficient Close-Mesh face for FREE AIRFLOW — SCREENS OPENING so you can't see through. MULTIPLE VALVES are centered the short way for EASY OPERATION.

Check your U.S. Register Catalog for every job — it shows the most complete line of all. New No. 55-6 Complete Register and Grille Catalog sent on request.

UNITED STATES REGISTER COMPANY

BATTLE CREEK, MICHIGAN

MINNEAPOLIS • KANSAS CITY • ALBANY

SOLD BY LEADING JOBBERS FROM COAST TO COAST

Dual Furnaces Provide School Heating Economy

(*Continued from page* 104)

3 ELBOW DUCTS connect main supply ducts set in vermiculite concrete with smaller ducts, which are eventually embedded in slabs

4 SPACE ABOVE DUCTS in trench forms passage for air to return to furnace. In one campus style plan, no trench was used

Upon a demand for increased temperature in any classroom, the room thermostat operates a motor which positions dampers in the bypass duct and bonnet duct for the classroom so that less bypass air and more warm air from the bonnet is delivered. Each classroom thermostat operates its own set of dampers.

Room air is exhausted through wardrobe closets and gravity roof ventilators equal to the amount of outdoor air introduced into the room.

Dual Furnaces for Flexibility

Each furnace is equipped with an automatic humidifier with controls. A glycol dispenser introduces glycol vapor into the suction side of each furnace blower so that the airborne bacteria count is reduced in the entire building. In addition, all outdoor air and recirculated air is filtered at the intake for each furnace blower.

Two furnaces in several of the schools provide flexibility and economy of operation. The furnaces, which normally supply different sections of the building, are cross connected so that either unit can serve the entire building in an emergency.

In one campus type school, each building has a separate heating plant. Preliminary figures indicate that over $15,000 will be saved by using four separate heating plants instead of one central plant. Bids have since been received and contracts let. The savings were $18,200. Also, fuel costs have been 15 to 35 percent lower.

Furnaces in some of the schools burn No. 2 fuel oil, but others burn cold No. 5 oil, without preheating.

Induced draft fans are used in all schools to assure consistent constant combustion and architectural freedom of design.

Controls in all but the smallest schools are pneumatic.

Here's What It Costs

Our experience indicates that warm air panel heating can be installed for an initial cost between $1.10 and $1.60 per sq ft, depending on the extent of the controls, the type of fuel, the warmth of the floors desired, and the number of furnaces employed. In each of the schools, the furnace is in a basement below the first floor level, with the rest of the building on grade.

However, it is possible to install the furnace in a room on the first floor level.

Subsequent jobs have been designed with furnace rooms on the main floor. In some cases, it has been possible to limit the furnace room height to 8 ft.

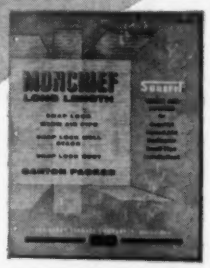
Heat Exchanger Saves Fuel

One feature which we are designing for all warm air heated schools now is a heat exchanger whereby the air which is exhausted from classrooms, gymnasiums, and auditoriums preheats the incoming ventilation air, resulting in a considerable fuel savings.

The heat exchanger is fabricated of metal and is easily adapted to all installations.

MONCRIEF

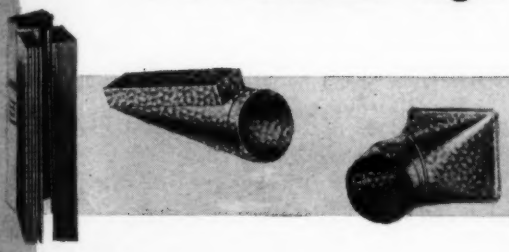
SUREFIT® CARTON-PACKED SNAP LOCK PIPE AND FITTINGS



Completely illustrated, new, 16-page Catalog is yours for the asking. Write, today, for your FREE copy and the name of your nearest Moncrief Fittings Wholesaler.

ADI STAMPED FITTINGS

- **Made Right**
- **Fit Right**
- **Packaged Right**
- **PRICED Right**



Snap Lock Round Pipe . . . Snap Lock Duct . . . Snap Lock Wall Stack . . . Now Available in LONG LENGTHS

For installations requiring long runs . . . Moncrief Snap Lock pipe, duct and wall stack are furnished, carton-packed, in easy-to-handle 5 ft. lengths.

Available for Extended Baseboard . . . Perimeter System . . . Outside Wall Diffuser Installations

2¼" x 12" Snaplock Fittings Are Now Available

The up-to-date way to make better, more economical installations is with Moncrief Snap Lock Pipe, Duct, Stack and Fittings. Machine fabrication in our mechanized shop provides lower prices and factory quality control. Ingenious Snap Lock provides easier handling and surer fit. Carton Packing protects against shipping damage and corrosion in storage.

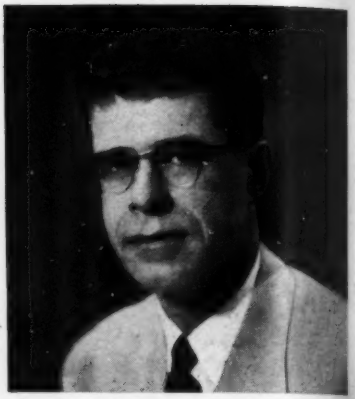
With the busy installation season just ahead, there's one sure way to save installation time and money. That's with Moncrief Surefit Pipe and Fittings.

It will pay you to order your requirements from your Moncrief Fittings Wholesaler, now!

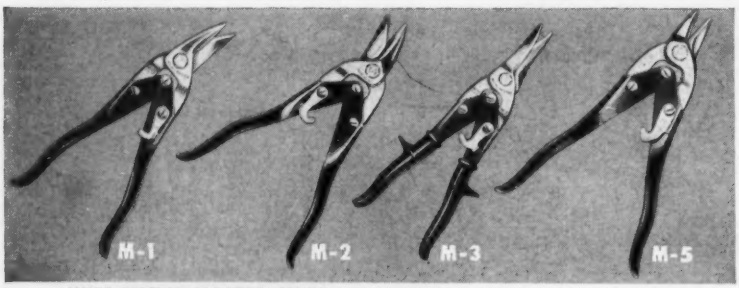
THE HENRY FURNACE COMPANY • Medina, Ohio

HEATING AND AIR CONDITIONING UNITS — MONCRIEF — FURNACE PIPE AND FITTINGS

"WE HAVE SOLD WISS SNIPS FOR 25 YEARS BECAUSE THEY CUT BEST WITH LEAST EFFORT"

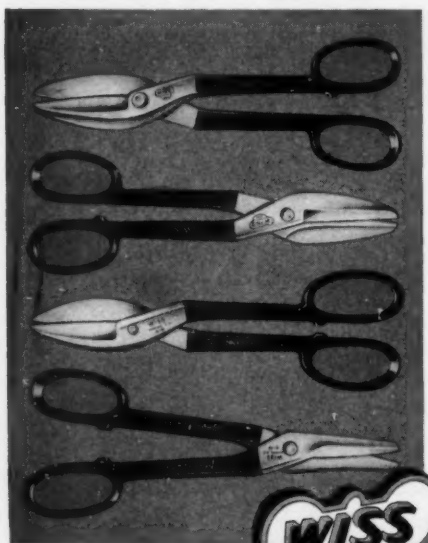


Lee J. Haines, President of E. E. Souther Iron Co., St. Louis, Mo., gives one big reason why his firm likes to recommend Wiss metal cutting snips. There are several reasons why they are the choice of professional workers everywhere—why they sell better, with fewer returns. Wiss snips are produced largely by the handwork of skilled workers. Each pair is rigidly tested and guaranteed perfect. Bolts are set precisely to reduce wear and to increase cutting power with the least effort.



WISS METAL MASTER SNIPS: Compound action design delivers amazing cutting power. These 10" snips cut with about one-half the effort required for standard 12½" snips. One edge serrated to prevent slipping. M-1 (cuts left) and M-2 (cuts right) are designed to cut the most intricate scrolls and circles. M-3 is for shallow arcs and straight cutting. M-5 Bulldog Heavy Duty snips are tops for notching, nibbling and cutting shallow arcs in sheet metal as heavy as 16 gauge.

Wiss inlaid blades are made of high carbon crucible steel welded to a hot drop-forged frame to provide the extra service demanded by professional workers.



WISS INLAID SNIPS

High carbon crucible steel welded to a hot drop-forged frame provides that *extra* service demanded by professional users everywhere. Six Straight Cutting sizes from 11½" to 17", including Bulldog Snips for notching. Three Combination* Cutting sizes, 12½", 13½" and 14½".

WISS SOLID STEEL SNIPS

For those whose requirements are less specialized than the professional user. Hot drop-forged of fine carbon steel, they meet or exceed government specifications. Four straight cutting sizes, 8" to 12½". Four Combination* Cutting sizes, 7", 10", 13" and 16" Bulldog Snips for notching.

*Made with straight blades, but ground and shaped so they readily cut curves and irregular shapes as well as straight.

Wiss snips are hot drop-forged of the finest steels available.

Highly skilled craftsmen make final adjustments to assure that Wiss snips will cut perfectly for a long time.

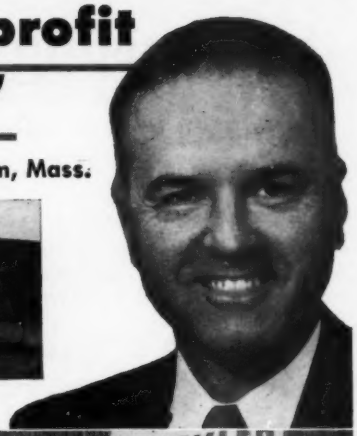
J. WISS & SONS CO., NEWARK 7, NEW JERSEY

Manufacturers of Shears, Scissors, Pinking Shears, Metal Cutting Snips and Garden Shears

"Easy to sell WINKLER at a profit *against all competition*"

says Charles Andrias, President of George W. Pickering Co., Salem, Mass.

Pickering truck fleet lines up for inspection.



Attractive Pickering display room affords every facility for sales-making demonstrations of Winkler products.

Winkler Training Institute

A completely equipped school where Winkler dealers and their personnel are taught how to turn Winkler Products into *profits!* In the sales and engineering classes, Winkler trainees *hear . . . see . . .* and *actually do* the things which assure successful selling and the proper installation of Winkler Products.

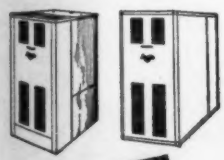
One dealer writes, "Judging from the reaction of our new salesman who just returned from your Retail Sales Training Clinic, your classes are conducted by men who not only know how to sell, *but can teach selling!* His enthusiasm and *300% increase in* sales since his return are evidence of the benefit he received."

If you're searching for a faster selling, more profitable line of heating equipment, the following letter from Mr. Andrias will give you a welcome clue—

"We have been Winkler dealers for the Boston North Shore Area since 1948. During that time the dynamic sales features and the outstanding performance record of Winkler have continuously resold us on this fine equipment.

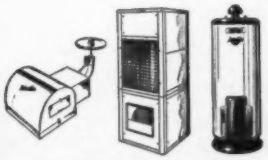
"Our salesmen learned that the above and the excellent sales promotion assistance offered by the factory make it easy to sell Winkler at a profit against all competition. We are enjoying our biggest year with Winkler and are looking forward to many years of profitable and pleasant associations with your company."

Note again these points in Mr. Andrias' letter—"*dynamic sales features*"..."*excellent sales promotion assistance.*" Add to these the fact that Winkler offers America's *most complete line of home comfort equipment* and you have the reasons why the Winkler Franchise gives you the edge! Why not get the facts today?



Oil, Coal, Gas-Fired Boilers and Furnaces . . . Gas Conversion Burners . . . Oil Burners . . . Stokers . . . Air Conditioners . . . Water Heaters

WINKLER



WRITE TODAY FOR DIRECT FACTORY FRANCHISE DETAILS

STEWART-WARNER CORPORATION

U. S. MACHINE DIVISION • Dept. A-85 • LEBANON, IND.

• AUTOMATIC •
WINKLER
HEATING EQUIPMENT

Housing Census Heating Data

Atlantic City • Binghamton, N.Y. • Decatur, Ill. • Knoxville Lorain-Elyria, O • Springfield, Mass.

SUGGESTIONS on how a warm air heating dealer can use some of the housing data available from the Bureau of Census were given in the November 1954 American Artisan. Localities covered in the reports are metropolitan areas that are socially and economically integrated with the central city. Data for various areas has been reported regularly in American Artisan since May 1953. Additional reports will continue to appear regularly.

Types of Fuel Used in Centrally Heated Dwelling Units

	Standard Metropolitan Areas											
	Atlantic City N. J.	Binghamton N. Y.	Decatur Ill.	Knoxville Tenn.				Lorain-Elyria Ohio	Springfield Mass.			
	Atlantic County	Broome County	Macon County	The area	Anderson County	Blount County	Knox County	Lorain County	The area	Hampden County (Part)	Hampshire County (Part)	Hartford County Conn. (Part)
All dwelling units	48,604	55,264	31,484	94,610	17,848	14,706	62,056	43,044	116,294	99,292	12,689	4,313
Number reporting heating equipment	39,570	52,320	30,405	87,595	14,965	13,620	59,010	40,790	112,855	96,565	12,210	4,080
Central heating	33,520	42,215	21,580	26,115	5,235	2,485	18,395	32,220	83,940	72,725	8,830	2,385
Coal	12,760	27,250	16,665	22,650	4,045	2,190	16,370	17,055	40,115	35,250	3,845	1,020
Wood	270	205	65	105	15	25	65	145	525	400	115	10
Utility gas	3,790	10,055	2,710	140	...	5	135	11,820	6,520	5,995	505	20
Bottled gas	115	125	40	15	...	...	15	145	210	155	45	10
Liquid fuel	15,155	3,685	1,660	1,290	185	145	960	2,505	34,415	28,900	4,225	1,290
Other fuel	860	650	360	1,720	945	80	695	435	1,360	1,290	45	25
Not reporting	570	245	80	240	45	40	155	115	795	735	50	10

Types of Nonfarm Dwelling Units, by Type of Heating and Year Built

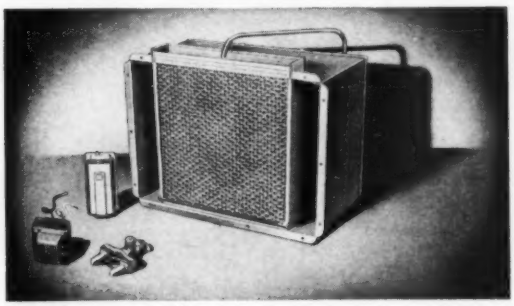
	Total occupied						Owner occupied			Renter occupied				
	Total	1 dwelling unit, detached	Other 1, and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more	Total	1 dwelling unit, detached	All other dwelling units	Total	1 dwelling unit, detached	Other 1, and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more
Standard Metropolitan Area of Atlantic City, N.J. — Atlantic County															
All occupied units	37,400	17,720	10,505	2,850	2,310	4,015	19,780	14,225	5,555	17,620	3,495	6,045	2,255	2,005	3,820
HEATING EQUIPMENT															
Central heating	31,379	13,787	9,140	2,686	2,046	3,720	16,804	11,663	5,141	14,575	2,124	5,020	2,092	1,742	3,597
Piped steam or hot water	25,846	8,916	8,642	2,567	2,023	3,698	12,185	7,363	4,822	13,661	1,553	4,780	2,011	1,742	3,575
Warm air furnace	5,533	4,871	498	119	23	22	4,619	4,300	319	914	571	240	81	...	22
Noncentral heating, with flue	3,966	2,809	943	101	74	39	1,977	1,781	196	1,989	1,028	764	101	74	22
Nonctrl. htng., without flue; or not htd.	1,330	772	360	...	93	105	637	521	116	693	251	261	...	93	88
Not reported	709	351	59	60	93	146	354	260	94	355	91	...	60	93	111
YEAR BUILT															
1945 or later	2,938	2,313	514	31	...	80	2,206	2,020	186	732	293	359	...	...	80
1940 to 1944	295	244	51	...	...	...	243	218	25	52	26	26	...	...	...
1939 or earlier	32,761	14,486	9,732	2,734	2,222	3,587	16,757	11,577	5,180	16,004	2,909	5,584	2,202	1,917	3,392
Not reported	1,400	676	206	83	88	347	569	409	160	831	267	77	52	88	347
Standard Metropolitan Area of Binghamton, N.Y. — Broome County															
All occupied units	48,420	24,015	12,835	5,785	3,795	1,990	27,545	20,995	6,550	20,875	3,020	7,670	4,685	3,560	1,940
HEATING EQUIPMENT															
Central heating	39,483	20,119	10,288	4,410	2,870	1,796	23,815	18,040	5,775	15,668	2,079	5,666	3,440	2,687	1,796
Piped steam or hot water	13,337	4,142	3,198	2,330	2,158	1,509	5,634	3,726	1,908	7,703	416	1,809	1,942	2,027	1,509
Warm air furnace	26,146	15,977	7,090	2,080	712	287	18,181	14,314	3,867	7,965	1,663	3,857	1,498	660	287
Noncentral heating, with flue	7,308	3,196	2,090	1,142	710	170	3,004	2,386	618	4,304	810	1,656	1,034	684	120
Nonctrl. htng., without flue; or not htd.	1,133	517	305	191	120	...	499	386	113	634	131	240	169	94	...
Not reported	495	182	152	43	94	24	225	182	43	270	...	109	43	94	24
YEAR BUILT															
1945 or later	4,096	3,422	192	166	105	211	3,327	3,194	133	769	228	59	166	105	211
1940 to 1944	1,716	1,632	29	55	...	...	1,556	1,556	...	160	76	29	55	...	...
1939 or earlier	41,761	18,585	12,413	5,480	3,584	1,699	22,291	16,971	6,320	19,470	2,614	7,434	4,407	3,349	1,666
Not reported	841	375	200	81	105	80	369	273	96	472	102	147	55	105	63

(*Continued on page* 116)

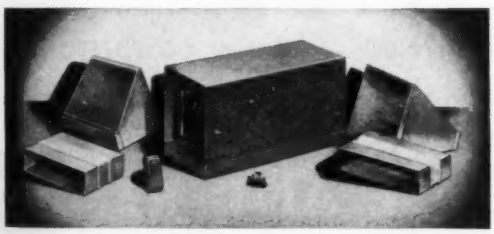
NOW...you can sell HUMIDITY

POSITIVELY CONTROLLED—AUTOMATIC
HIGH CAPACITY...FOR ANY TYPE HOME

THE NEW RP Aprilaire
AUTOMATIC • ELECTRIC
HUMIDIFIER



PLENUM MODEL—for forced air furnaces. Easily mounted on warm air bonnet. Uses plenum heat for evaporation—furnace fan and ducts for distribution of humidified air.



UNIVERSAL MODEL—installed on or between joists in basement or crawl-space. Flexibility of installation permits baseboard or wall registers.

PORTABLE MODEL—no installation necessary. Ideal for offices, apartments—wherever a permanent installation is not desired.

The *proper* relative humidity is no longer a heating season problem! Now, with the new automatic-electric Aprilaire humidifier, you can offer your customers *positively controlled humidity* ...with plenty of capacity...gravity water feed over evaporator...trouble-free service. There's an Aprilaire model for any type home or office—all controlled by positive action humidistat that your customer just sets and forgets... for the right humidity for better health, greater comfort and economy.

SEND IN COUPON FOR COMPLETE INFORMATION

RP ... PRODUCTS OF RESEARCH

RESEARCH PRODUCTS CORP.
MADISON 10, WISCONSIN

RESEARCH PRODUCTS CORPORATION
Dept. 91, Madison 10, Wisconsin

I'm interested in the Aprilaire. Send me more information including literature, prices, specifications and the profit-making proposition.

CO. NAME_____

ADDRESS_____

CITY_____ STATE_____

BY_____

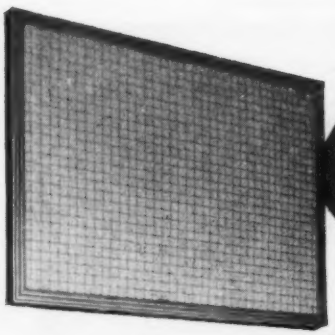
QUICKLY
(AND EASILY)
RINSED
AND READY FOR RE-USE:

DYCON TYPE DY

THE NEW AND BETTER PERMANENT-TYPE DRY

AIR FILTER

FOR WARM AIR FURNACES AND AIR CONDITIONERS



Efficient plastic media in durable aluminum frame ends constant replacement costs of old-fashioned throwaway filters.

JUST RINSE AND RE-USE

Flush briefly with cold water from faucet or nozzle-less hose, shake, and put back in service immediately—good as new again.

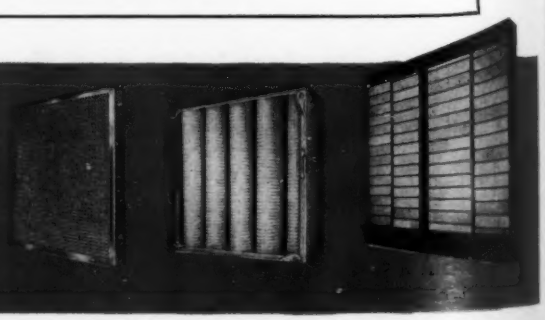
BUILDS PROFITS FASTER, TOO:

Worth more . . . sells for more—provides full mark-up and bigger profits. National advertising and promotion to boost your sales. Contact your Continental representative, or write direct today for the profitable details.

AIR CONTINENTAL FILTERS

P. O. BOX 1647 LOUISVILLE 1, KY.

CONTINENTAL AIR FILTERS Inc.



Good things happen when you "sign up" with G.E.

If politicians were home heating and cooling dealers, they'd all switch to G.E. That's because they believe in the adage "if you can't beat 'em—join 'em."

And a good idea for dealers who are tired of tilting at windmills or bucking headwinds is to jump on the G.E. "brandwagon"...and enjoy the advantages that belong to the man who hangs the G-E monogram over his shop. For example;

- *A full line of the finest home heating and cooling units made.*
- *Units designed for every house, no matter what the design, type, size, location or climate.*
- *Units that carry the famous G-E Warranty offering you and your prospects more protection mileage than any other in the business. And that includes a 5 year protection plan on the sealed-in system of the cooling unit.*

Like most G-E dealers, you'll find that the good things in life come a lot easier and faster when you work hand-in-hand with G.E. Send the coupon below. It is just possible there is a juicy franchise still open in your territory. When you get the full story on the great G-E line and the "Franchise with a Future"...we think you'll be glad to "join us."

HOME HEATING & COOLING DEPT.

Progress Is Our Most Important Product

GENERAL ELECTRIC

*Reg. Trade Mark of General Electric Co.

GENERAL ELECTRIC CO.
HOME HEATING & COOLING DEPT. AA-85
BLOOMFIELD, N. J.

Yes, I want the facts on why "signing up" with G.E. will step up my sales and progress.

NAME_____

TYPE OF BUSINESS_____

ADDRESS_____

CITY_____ COUNTY_____ STATE_____

Housing Census Heating Data

(*Continued from page* 112)

Types of Nonfarm Dwelling Units, by Type of Heating and Year Built

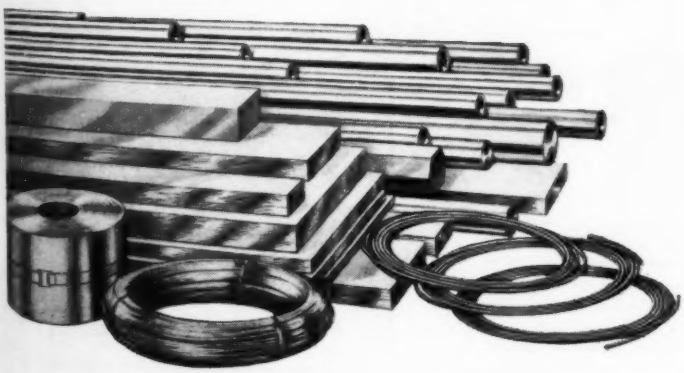
	Total occupied						Owner occupied			Renter occupied					
	Total	1 dwelling unit, detached	Other 1, and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more	Total	1 dwelling unit, detached	All other dwelling units	Total	1 dwelling unit, detached	Other 1, and 2 dwelling unit	3 and 4 dwelling unit	5 to 9 dwelling unit	10 dwelling unit or more
Standard Metropolitan Area of Decatur, Ill. — Macon County															
All occupied units	27,425	20,600	2,890	1,925	1,245	765	18,360	16,955	1,405	9,065	3,645	1,850	1,665	1,170	735
HEATING EQUIPMENT															
Central heating	19,312	13,773	2,195	1,551	1,097	696	13,120	12,036	1,084	6,192	1,737	1,421	1,328	1,040	666
Piped steam or hot water	2,986	890	345	547	561	643	960	740	220	2,026	150	248	473	542	613
Warm air furnace	16,326	12,883	1,850	1,004	536	53	12,160	11,296	864	4,166	1,587	1,173	855	498	53
Noncentral heating, with flue	7,124	6,243	509	307	65	...	4,801	4,571	230	2,323	1,672	316	270	65	...
Nonctrl. htng., without flue; or not htd.	698	411	186	23	43	35	334	261	73	364	150	113	23	43	35
Not reported	294	173	...	45	41	35	106	87	19	188	86	...	45	22	35
YEAR BUILT															
1945 or later	3,501	3,477	...	24	...	...	3,055	3,055	...	446	422	...	24	...	...
1940 to 1944	1,752	1,142	24	166	228	192	991	991	...	761	151	24	166	228	192
1939 or earlier	21,607	15,724	2,712	1,640	988	543	14,065	12,772	1,293	7,542	2,952	1,754	1,380	913	543
Not reported	537	259	154	95	29	...	220	138	82	317	121	72	95	29	...
Standard Metropolitan Area of Knoxville, Tenn. — Anderson, Blount and Knox Counties															
All occupied units	76,195	58,760	8,345	4,360	2,850	1,880	39,879	36,925	2,945	36,325	21,835	6,120	3,825	2,685	1,860
HEATING EQUIPMENT															
Central heating	24,519	16,078	2,957	2,560	1,625	1,299	12,337	10,938	1,399	12,182	5,140	2,003	2,268	1,492	1,279
Piped steam or hot water	6,875	3,273	657	942	1,024	979	2,004	1,713	291	4,871	1,560	566	845	941	959
Warm air furnace	17,644	12,805	2,300	1,618	601	320	10,333	9,225	1,108	7,311	3,580	1,437	1,423	551	320
Noncentral heating, with flue	43,842	35,877	4,857	1,576	1,096	436	22,288	20,985	1,303	21,554	14,892	3,790	1,357	1,079	436
Nonctrl. htng., without flue; or not htd.	6,675	5,926	397	202	92	58	4,636	4,498	138	2,039	1,428	283	178	92	58
Not reported	1,159	875	135	22	40	87	610	502	108	549	373	44	22	23	87
YEAR BUILT															
1945 or later	12,899	10,811	1,200	320	342	226	8,173	7,930	243	4,726	2,881	985	292	342	226
1940 to 1944	13,066	10,770	1,089	707	73	427	4,769	4,769	...	8,297	6,001	1,089	707	73	427
1939 or earlier	48,617	36,048	5,829	3,260	2,304	1,176	26,144	23,571	2,573	22,473	12,477	3,915	2,753	2,172	1,156
Not reported	1,610	1,130	226	73	131	50	783	654	129	827	476	130	73	98	50
Standard Metropolitan Area of Lorain-Elyria, O. — Lorain County															
All occupied units	37,380	26,550	7,135	2,380	915	400	24,945	22,025	2,920	12,435	4,525	4,655	1,995	875	500
HEATING EQUIPMENT															
Central heating	29,408	21,028	5,719	1,715	682	264	20,779	18,257	2,522	8,629	2,771	3,544	1,394	656	264
Piped steam or hot water	5,310	3,336	871	561	319	223	3,236	2,838	398	2,074	498	614	433	306	223
Warm air furnace	24,098	17,692	4,848	1,154	363	41	17,543	15,419	2,124	6,555	2,273	2,930	961	350	41
Noncentral heating, with flue	6,422	4,478	1,061	592	210	81	3,403	3,092	311	3,019	1,386	827	528	197	81
Nonctrl. htng., without flue; or not htd.	950	577	283	48	22	20	407	360	47	543	217	236	48	22	20
Not reported	599	470	70	24	...	35	356	318	38	243	152	47	24	...	35
YEAR BUILT															
1945 or later	5,903	5,161	697	...	45	...	4,892	4,635	257	1,011	526	460	...	25	...
1940 to 1944	2,209	1,978	107	74	50	...	1,767	1,741	26	442	237	81	74	50	...
1939 or earlier	28,153	18,581	6,223	2,181	795	373	17,720	15,161	2,559	10,433	3,420	4,033	1,847	775	358
Not reported	1,114	829	107	125	25	28	564	487	77	550	342	81	74	25	28
Standard Metropolitan Area of Springfield, Mass. — Parts of Hampden, Hampshire and Hartford Counties															
All occupied units	108,585	40,195	30,040	15,020	13,725	9,605	50,255	35,125	15,130	58,330	5,070	18,020	12,600	13,180	9,460
HEATING EQUIPMENT															
Central heating	79,956	34,661	22,340	8,727	7,305	6,923	43,524	30,959	12,565	36,432	3,702	12,165	6,823	6,930	6,812
Piped steam or hot water	60,995	23,485	17,457	6,413	6,846	6,794	30,644	20,793	9,851	30,351	2,692	9,348	5,084	6,522	6,705
Warm air furnace	18,961	11,176	4,883	2,314	459	129	12,880	10,166	2,714	6,081	1,010	2,817	1,739	408	107
Noncentral heating, with flue	22,776	4,008	5,927	5,184	5,435	2,222	5,153	3,111	2,042	17,623	897	4,499	4,728	5,299	2,200
Nonctrl. htng., without flue; or not htd.	4,290	904	1,378	934	764	310	1,013	657	356	3,277	247	1,070	914	747	299
Not reported	1,556	618	394	174	221	149	561	394	167	995	224	284	134	204	149
YEAR BUILT															
1945 or later	8,070	7,190	240	232	82	326	6,744	6,611	133	1,326	579	107	232	82	326
1940 to 1944	4,599	2,722	293	928	439	217	2,446	2,446	...	2,153	276	293	928	439	217
1939 or earlier	92,858	29,393	28,732	13,412	12,613	8,708	40,023	25,370	14,653	52,835	4,023	17,086	11,053	12,110	8,563
Not reported	3,056	892	773	447	591	353	1,042	699	343	2,014	193	533	386	549	353

OLD FRIEND!

CHASE

Since 1876, the name Chase has been the symbol of *top quality in brass and copper*. It also stands for unmatched *service!* Twenty-five Chase warehouses and three Chase mills form the most responsive and efficient source of brass and copper supply in the nation!

NEW SERVICE!



Now the Chase network assures you a dependable source of stainless steel, too! You specify the type, form and quantity. The Chase warehouse near you has it in stock—or will get it to you on the double, direct from another Chase warehouse or the mills. Call Chase today! Get those service experts working for *you* on your stainless steel requirements!

STAINLESS STEEL!

Chase®

BRASS & COPPER CO.

WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION

The Nation's Headquarters for Brass & Copper

Albany†	Chicago	Detroit	Los Angeles	New York	St. Louis
Atlanta	Cincinnati	Grand Rapids†	Milwaukee	Philadelphia	San Francisco
Baltimore	Cleveland	Houston	Minneapolis	Pittsburgh	Seattle
Boston	Dallas	Indianapolis	Newark	Providence	Waterbury
Charlotte†	Denver	Kansas City, Mo.	New Orleans	Rochester†	(†sales office only)

ALWAYS PROFITABLE! IT'S NOW COMPLETE!

GENERAL FILTERS OFFERS A FULL LINE

Starring the ☆ NEW MODEL 250 GENERAL HUMIDIFIER with Hydro-Flow Regulator

Won't Lime . . . Won't Stick . . . Won't Clog! Completely Automatic—and Trouble-Free!

The name ***GENERAL FILTERS*** has long meant ***greater profits*** for the Heating Contractor. Now—this famous, complete line offers another star—NEW GENERAL Warm Air Furnace HUMIDIFIER Model 250 . . . the same humidifier that "had them talking" at Philadelphia! Patented HYDRO-FLOW REGULATOR, a remarkably simple, foolproof automatic valve, makes the difference in the Model 250. It won't lime, stick or cause trouble in any way. *Eliminates floats, needle valves, evaporator plates, overflow lines . . .* Once installed, it assures scientifically-moistened, healthful air and *completely trouble-free service!* WRITE TODAY for the full story!

Plus these famous products . . .

IMPROVED!
Model 1A-25A GENERAL FUEL OIL FILTER

SMALL

- *New, leakproof seal* in cap.
- *New buna gasket compound* impervious to Nos. 1, 2 or 3 oils.
- Famed *"step-design"* wool felt element—pioneered by GF.
- *Lifetime* cast-iron and steel construction. *No soft metals used.*

IMPROVED!
Model 2A-700A GENERAL FUEL OIL FILTER

MEDIUM

- *Completely re-styled* cap and seal.
- *New cupped rim* in bowl . . . *buna gasket . . . can't leak!*
- Finest wool felt *"step-design"* cartridge cleans oil thoroughly.
- Solid *cast iron* cap . . . *all steel* bowl for added dependability.

DELUXE!
Model 2A-300 GENERAL FUEL OIL FILTER

EXTRA LARGE

- *Extra large for big jobs and dirty tanks.*
- *Depth-type filtration* traps particles, moisture.
- *Screw type handle* locks, releases *without tools.*
- *Big 63 cu. in. deluxe cartridge—metal encased.*

MODEL 90 WATER TRAP

Bottom or Side Outlet Tanks

Eliminates water problems in bottom or side outlet tanks. Takes water from oil *before* it reaches filter; protects filter, nozzle, pump. Interchangeable ⅜" inlet-outlet and ¾" threaded brass drain plug.

MODEL 2A-17

For Heavy Oils Nos. 4, 5, or 6

Cleanable Monel mesh screen assure even flow of heavy oils while removing injurious solids. Provides economy of 4, 5 or 6 oils; eliminates replacement costs. Gravity or pressure type burners.

CLEAN RIGHT SOOT REMOVER

Made specially for General Filters

Cuts your customers' heating costs by as much as 25%! Removes ½" layer of soot in 2-5 minutes. Gentle, slow-burning, non-explosive, non-corrosive. Complete directions on package.

GET THE HABIT!
Stock and Sell the Profitable, Full GENERAL LINE

GENERAL FILTERS, INC.

43800 GRAND RIVER AVENUE • NOVI, MICHIGAN

Canadian General Filters, Ltd. • 39 Crockford Blvd. • (Scarboro) Toronto, Canada

quality performance is so important... it's guaranteed by Sequoia

FORCED AIR GAS FURNACES AND AIR CONDITIONERS

Original price is a factor, of course. That's why Sequoia forced air gas furnaces are nationally available at competitive prices—reasonable, consistent prices!

But performance quality tells its story just as plainly on any heating dealer's profit and loss statement! In the cost of service call-backs... of replacing dissatisfied builder clients... and of appeasing trouble-besieged users. Or lack of such costs.

SEQUOIA backs up its claims of quality—every furnace shipped contains the homeowner's printed 10-year guarantee. And that same guaranteed quality now is reflected on the financial statements of hundreds of dealers, coast to coast.

IT COULD BE ON YOUR'S. *You are invited to join this profitable dealer sales organization.*

For full details contact

SEQUOIA MANUFACTURING CO.

1000 BRITTAN AVENUE • SAN CARLOS, CALIFORNIA

YOU AND THE LAW

Who's Responsible for Errors in Advertising Copy?

The publisher's mistakes and omissions are his responsibility, most courts agree, but he can seldom be held liable for damages over the price paid for the ad

THE PUBLISHER of a telephone directory contracted to carry the business advertisement of a warm air heating and air conditioning dealer who paid the existing rate. On publication of the directory the dealer found the advertisement did not contain the correct address or telephone number as it had been submitted in the advertising copy.

While the courts ordinarily do not hesitate to hold the publisher liable for damages for negligence in such cases, it is difficult to establish the damages beyond the actual amount paid the publication.

A lawsuit of the same nature was recently brought against a prominent southern daily newspaper by a local business firm whose paid advertisement contained an error which changed a clearance sale statement to read "50 percent off" instead of "25 percent off" on merchandise, as the client's copy had stated.

Damages Are Intangible

The merchant recovered a judgment against the newspaper for $4000 in damages. While the appellate court in that state sustained the right of the advertiser to a recovery it refused to accept the computation of damages on the ground that the amount was mere speculation. The court stated:

"Regardless of the unique situation here presented and the difficulties of fixing with reasonable certainty the amount of damages, it must be kept in mind that this is a negligence case and as such the damages must not only be reasonably ascertained but also must be the proximate and reasonable result of the negligent act."

This difficulty in ascertaining the damages from such mistakes with reasonable accuracy is a recurring feature in similar lawsuits. A contract for the publication of an advertisement was made with a large midwestern newspaper, in which the advertiser received a receipt which was very explicit in its stipulations as to placement of the notice in the paper's business index. When the business index was published the notice of this advertiser had been omitted.

Liability Ends with Refund

In reversing a judgment against the newspaper for any amount over the ten dollars paid for the insertion of this advertisement, the appellate court said:

"As the matter stands the amount of the damages outside of the contract price paid is wholly uncertain and speculative. His damages consist first of the contract price paid, and second in the deprivation of the advantages or profits which he would have realized as a result of the advertisement if it had been published.

"There is no other conceivable loss or damage to which he has been subjected by reason of the non-performance of the newspaper's contract. Of these two items the first is fixed, certain and proximate, while the second is merely speculative and remote and therefore incapable of being estimated or made the subject of a recovery at law."

Did Negligence Affect the Sale?

This same gremlin of uncertainty prevented another advertiser nearly a century ago from recovering damages from an eastern newspaper for failure to publish an announcement of the sale of real estate for which the advertiser had paid six dollars. In limiting the recovery from the newspaper to the six dollars it had received, the court said:

"We must limit ourselves to what is certain and obvious or run the risk of doing great wrong. The advertiser seeks to have the damages measured by the difference between the sale and a fair price but we do not know that the publisher's fault caused this difference. We know not that any person desiring to buy such a place stayed away and perhaps the best bidders were present. The natural consequence of a want of no-

(*Continued on page* 124)

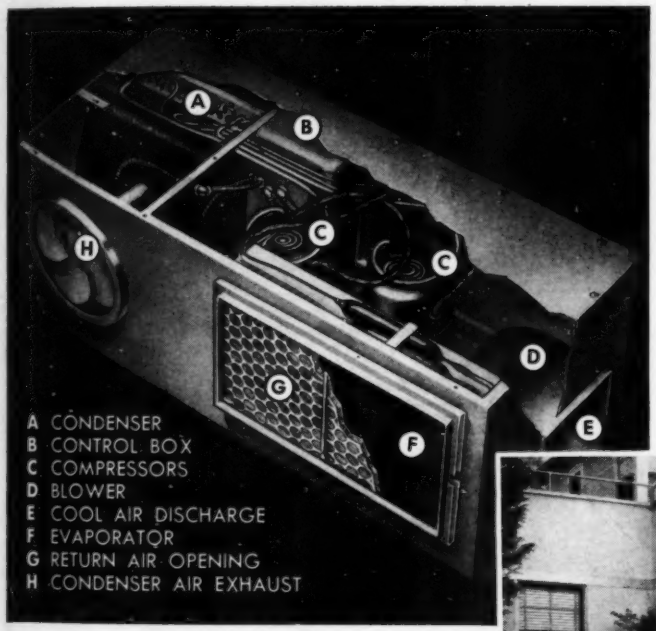
[*Note: While this discussion applies to actual cases, it should be remembered that legal rules vary in different states.*]

An Important Opportunity for

Every Air-Conditioner Dealer Who is Looking Ahead

Recently a new type central residential air conditioner, the result of the most basic engineering advances this industry has seen in years, was featured in HOUSE AND HOME. It was the new TEMTRON. Now proved in hundreds of installations to provide air conditioning at revolutionary new low operating costs, TEMTRON is being sold by a rapidly growing group of the finest dealers in the country.

If you are interested in the valuable TEMTRON dealership use the coupon below for further information.



TEMTRON

Central Residential Air Conditioners

- ★ *Three ton unit (two ¾ H.P. Compressors)*
- ★ *Two ton unit (one 1 H.P. Compressor)*
- ★ *30% to 50% less electricity*
- ★ *Only a trickle of water*
- ★ *No cooling tower*
- ★ *Easy installation*
- ★ *Operates at top efficiency at extremely high ambient temperatures*

Mr. Les R. Freeburg in front of his TEMTRON air-conditioned home at 5622 Chadwick Road, Fairway, Kansas, confirms TEMTRON'S low-operating costs to Mr. Don L. Covert, President, Covert Engineering Co., Kansas City, Mo., the local TEMTRON distributor.

Hundreds of TEMTRONS Already in Use

For over a year the TEMTRON has been proving that it is the lowest operating cost central residential air conditioner ever made. It uses a new principle in air conditioning applied for the first time by the engineers of the Ultrasonic Corporation, one of the U.S.A.'s leading scientific organizations. If you are a dealer who is looking ahead, here is an opportunity to work with the people who can supply you *today* with the air conditioner of the future.

TEMTRON AIR CONDITIONER
ULTRASONIC CORPORATION
Dept. 28, 640 Memorial Drive, Cambridge, Massachusetts

Please send me information about the TEMTRON Dealer Franchise.

Name.....
Company.....
Address.....
City.....*Zone*....*State*.....

NO MORE "UPS AND DOWNS" IN TEMPERATURE...

when you install "Constant Comfort"

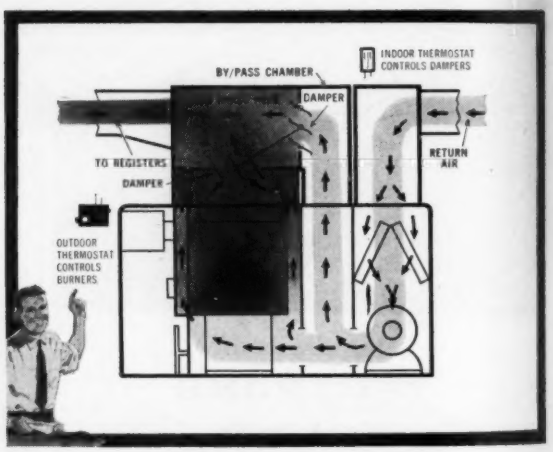
Waterbury Comfortrol BY/PASS HEATING®

It opens up a new market for you!

Home owners are asking more questions about *comfort* these days . . . and taking a closer look at heating plants, too. When you install new Waterbury COMFORTROL By/Pass Heating, you *can* promise *constant comfort* . . . a constant flow of air at "just right" temperature that eliminates the "hot-and-cold" feeling that comes with ordinary on-and-off heat.

No matter what kind of weather prevails outside, Waterbury COMFORTROL By/Pass Heating assures evenly-distributed comfort in *every* room in the house . . . with NO "layer-cake" heat, NO cold areas between you and the windows, NO hot or cold blasts! In fact, tests show less than one degree temperature variation between floor and ceiling with COMFORTROL!

Check into this *new concept* of home comfort. Install it! Talk about it! You, too, will find that Waterbury COMFORTROL By/Pass Heating *sells faster* because it's *better!*



HOW "COMFORTROL" WORKS: The Waterbury By/Pass System divides the air returning from the rooms, heats part of that air . . . mixes hot and cold together again in just the right proportions called for by both outside and inside thermostats . . . then sends a constant flow of warm—not hot—air back into every room in the house.

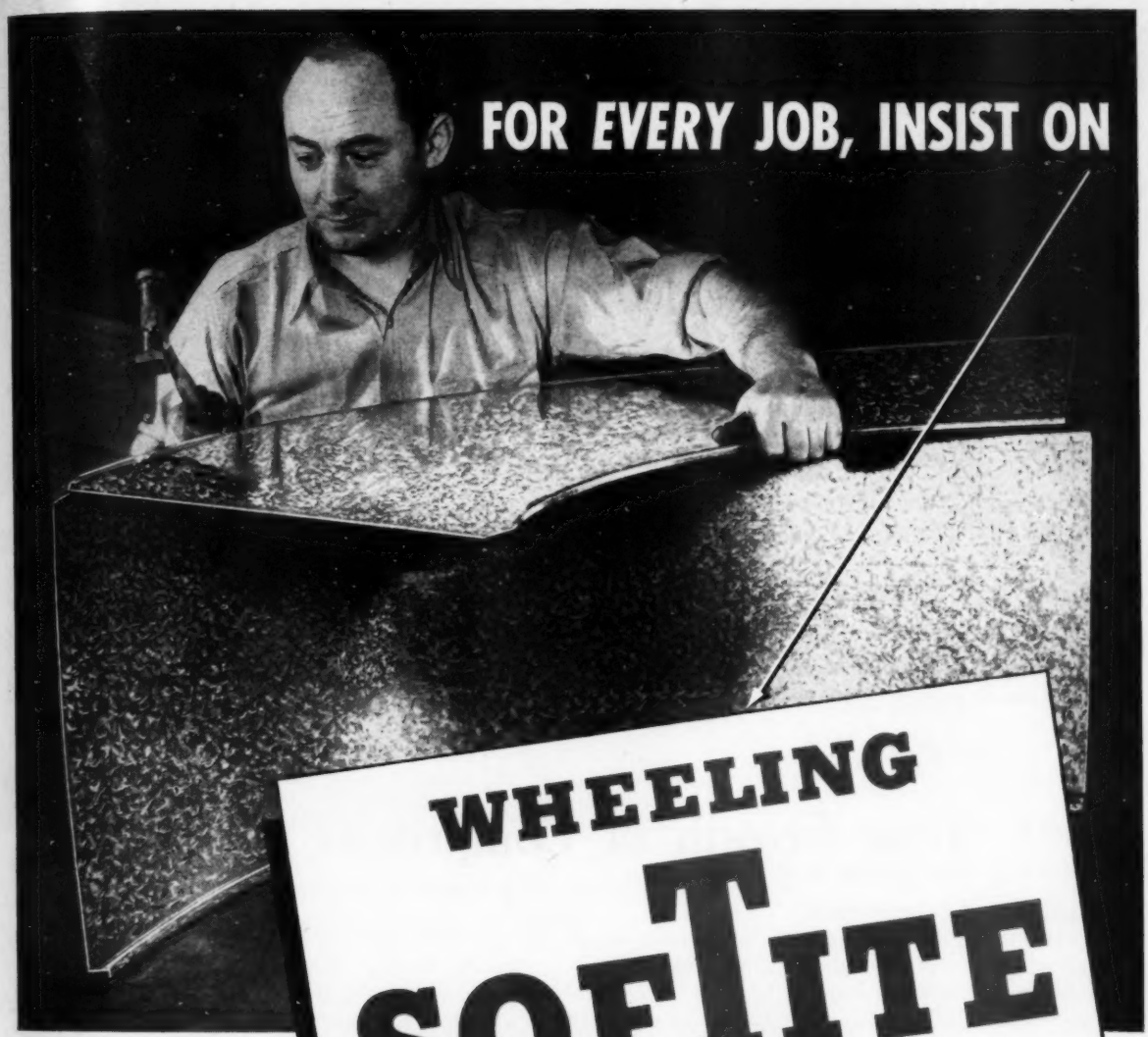
WORLD FAMOUS

Waterbury

FURNACES AND AIR CONDITIONERS

The WATERMAN-WATERBURY Company

MINNEAPOLIS 13, MINN.



Wheeling also manufactures a complete line of Galvanized Furnace Pipe, snap lock or closed seam Perimeter Heating or Air Conditioning Pipe, Style K Gutters, Square Conductor Pipe, Flashing, Valleys, and Fittings.

Make every job you do turn out *just right* — insist on Wheeling SOFTITE Galvanized Sheets. Here's as workable a sheet as you'll find anywhere ductile and amazingly tight coated.

And no matter how you fabricate Wheeling SOFTITE, the coating won't crack, won't flake. In fact, the coating will take anything the base metal will.

Put SOFTITE to any test. See why the demand for SOFTITE has forced Wheeling to triple its production facilities in 1955.

Try Wheeling SOFTITE once . . . you'll see why actual users call Wheeling SOFTITE the best galvanized sheet yet produced.

For details call the nearest Wheeling warehouse or office.

Galvanized steel does it better... SOFTITE does it best!

WHEELING CORRUGATING COMPANY, WHEELING, WEST VIRGINIA

For your convenience, warehouse stock immediately available at these locations: Boston, Buffalo, Chicago, Columbus, Detroit, Kansas City, Louisville, Minneapolis, New Orleans, New York, Philadelphia, Richmond, St. Louis. Sales Offices: Atlanta, Houston.

Advertiser Should Check Publication Copy

(*Continued from page* 120)

tice is that fewer persons would be present, yet this may not have affected the sale.

"In such a case the law holds a party liable for the actual damages which naturally grow out of the breach of duty and which ordinary forecast would expect to grow out of it, and which are proved and have actually grown out of it. We cannot give the loss on the sale as the measure of the newspaper's liability. They were liable only to refund the price paid for the advertisement."

Advertiser Shares Responsibility

A lawsuit brought in 1809 against a New England newspaper involved an advertisement printed incorrectly in three consecutive issues.

"The nature of the printer's undertaking," said the state court, "is such as that a minute and perfect transcript of an advertisement delivered to him in writing, or an exact correctness in the first impression beyond what may be expected from a general care and superintendence of the newspaper, is not to be understood in any contract for printing where no special caution has been given by the advertiser and no special undertaking has been expressed on the part of the printer. In ordinary cases the printer publishes relying on some continued care on the part of the advertiser that he will examine and verify the impression and for that purpose will give notice or will be attentive to have seasonably corrected any errors of importance.

"But for the incidental and remote consequences which may prove to be as in this case, losses and damages of a very considerable amount, the risk respecting them not having been stated to him and of which he has no warning — for these we think he is not liable upon what may be considered within the ordinary undertaking implied from his occupation.

"It is not to be supposed that he undertakes for the comparative and inconsiderable pay of an advertisement to have an exact correctness, independent of the attention of the advertiser and without any special caution or notice, at a risk so very extensive in the amount."

Tells Growth of Compressor Firm

BUT 4.5 PERCENT of the room air conditioner market has been tapped, and the demand for 2 to 5 hp compressors for central home air conditioning is in its infancy — these are two of the basic reasons cited by *Fortune* magazine for the remarkable growth of "little, big-rich" Tecumseh Products Co., of Tecumseh, Mich. According to *Fortune* Editor William R. Harris, in his article in the July issue, Tecumseh supplied last year about 48 percent of the compressors in the 5,630,000 domestic refrigerators, home freezers, and room air conditioning units sold by all manufacturers. Its sales of $124 million resulted in pretax earnings of nearly $12 million.

The central air conditioning field is richer in potential than all cooling markets yet tapped, says the article. Dollar volume for Tecumseh can be tremendous. However, the cost of 2 hp and up compressors forces many brand-name companies to re-examine their manufacturing policies and more and more are making their own compressors. But if demand rises to numbers that permit Tecumseh to "grind them out in mass," Fortune sees Tecumseh with a large share of this market, too.

According to *Fortune*, the key to the company's success isn't hidden. It holds no protective patents on products or processes, and owns no machinery others can't buy or duplicate. But its success lies in its effective use of it facilities for low cost production, and passing back savings to its customers in the form of price reductions.

Ray W. Herrick, chairman and founder, has shown "a genius for making things since he first got his hands on a machine tool some 40 years ago," says *Fortune*. His background and early working experiences gave him terrific drive. He is a firm believer in hard work, more pay for more work, and in efficient production. He controls Tecumseh, holds 53 percent of its stock. Last year, Joseph E. Layton succeeded him as president and chief executive officer.

He has made many things, might never have gotten into the refrigeration compressor business, the article says, were it not for Frank K. Smith, Curtis M. Brown and Jens K. Touborg, now executive vice presidents of the company. They entered the field with a compressor of their own design, got Herrick to make it for them. But only last May did they become formally associated with Herrick and Tecumseh. Before that — for 22 years — they were owners of the independent Tresco company, which did all of Tecumseh's product engineering and held sole sales rights to all of its refrigeration production.

Fortune's July article gives many details and most interesting background information on the early years and ups and downs of the company, the many fortunes made, development of the refrigeration compressor and the move to Tecumseh, Mich.

Sheets and strip?

All the types and sizes you want are here . . . ready for quick delivery to YOU

Because of the exceptionally large, ready-to-deliver stocks of dependable USS quality sheets and strip at each of our modern warehouses, we can supply you—without delay—with the type you want, in the grade and gage you want. (Even on your extra rush orders.) All the steel you order from us has been properly stored and carefully handled and bundled for shipping. It arrives in good, clean condition, ready for fabrication when you get it.

Accurate cutting on our modern equipment keeps tolerances to a minimum, reduces scrap loss. Each order is checked before it leaves the warehouse so you're certain of getting exactly what you specified.

Buying *all* your steel from one reliable source like U.S. Steel Supply saves a lot of time, trouble—and money. We are just as anxious to serve the smallest customer as the largest. Call us first next time you need sheets or strip . . . a little or a lot, common or hard-to-meet specs.

U. S. STEEL SUPPLY

DIVISION

General Offices
208 So. La Salle St., Chicago 4, Ill.

USS

Warehouses and Sales Offices
Coast to Coast

UNITED STATES STEEL

Call U. S. STEEL SUPPLY for ALL your steel needs . . .

Structural Shapes
Plates
Bars—Hot and Cold Finished
Sheets and Strip
Alloy Steels
Stainless Steels
Tubular Products
High Strength Steels
Aluminum
Industrial Supplies and Machinery
Reinforcing Bars, Wire Fabric
Floor Plates, Industrial Flooring

USS STEEL — UNITED STATES STEEL

SEE The United States Steel Hour. It's a full-hour TV program presented every other week. Consult your local newspaper for exact time and station.

Free . . . **Our Latest Stock List**
Contains everything you will want to know about our huge stocks. Tells what is available through our warehouse nearest you. All data is specific, complete, accurate—and easy to find. Send today for this big, all-new Stock List.

U.S. Steel Supply Division, Dept. 485
208 So. La Salle St.
Chicago 4, Illinois

Gentlemen:
Please send me, without charge, your latest Stock List.

Name .....
Company .....
Address .....
City ..... State .....

On duct-insulation jobs—

Low installation cost of Microlite and L·O·F Super·Fine can clinch the contract

Speed and ease of application can mean the difference in cost it takes to clinch a big insulation contract. That's why many contractors use L·O·F Glass Fibers' Super·Fine and Microlite to cut application costs without sacrificing insulating efficiency.

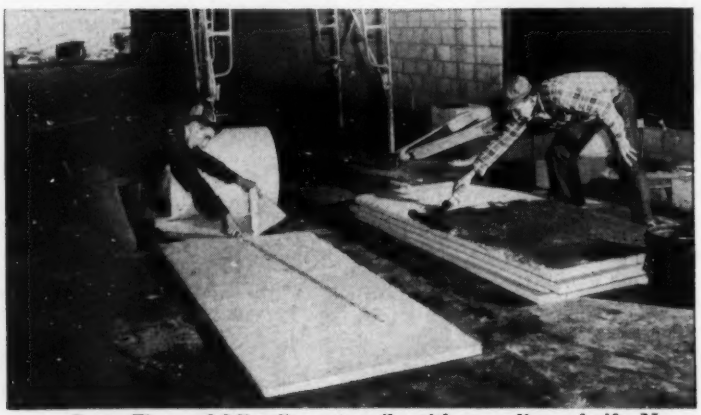
You'll find it simple to apply—These soft-textured blankets are pleasant to handle, quick to apply. Require no special tools or skills. Lightweight, resilient L·O·F Super·Fine and Microlite fill hard-to-reach places and are easy to manage on tall ladders or scaffolds. An unskilled worker can apply an average of 500 square feet of insulation a day.

The high insulating efficiency of Microlite and L·O·F Super·Fine results from the countless dead air cells formed by millions of fine glass fibers, which effectively reduce heat loss or gain.

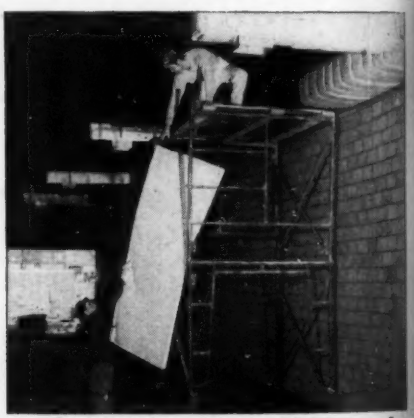
Save on storage space, too—L·O·F Super·Fine and Microlite come in tightly compressed rolls that take up less space and spring back to full thickness when unrolled. Available in blanket form up to 72″ wide, 5″ thick and from 50′ to 200′ long, depending on thickness. Also available with various facings to meet different insulation and code requirements.

Save on duct application costs with Microlite or L·O·F Super·Fine duct wrap and duct liner. Look in the Yellow Pages of the telephone directory for the name of our nearest distributor, or write: L·O·F Glass Fibers Company, Dept. 45-85, 1810 Madison Avenue, Toledo 1, Ohio.

Time- and cost-saving steps in a typical duct application



1. Super·Fine and Microlite cut easily with an ordinary knife. No precision measuring or fitting required. In this case, adhesive is brushed on the insulation.



2. Lightweight, strong blankets of Microlite or Super·Fine handle easily on scaffolds or ladders.

MICROLITE

L·O·F GLASS FIBERS

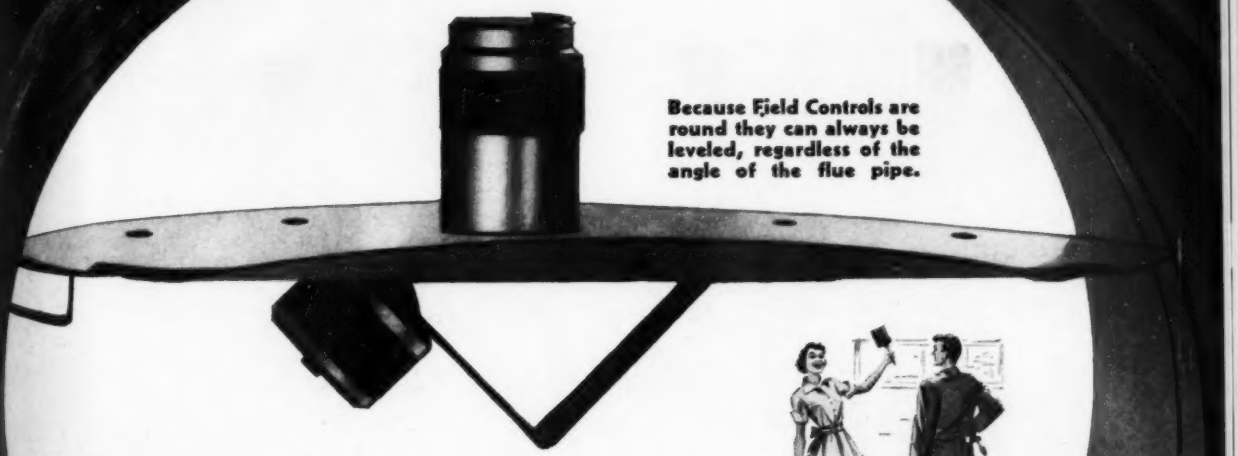
SUPER·FINE

L·O·F GLASS FIBERS COMPANY

TOLEDO 1, OHIO

Makers of glass fibers by the exclusive "Electronic-Extrusion" process

3. Super·Fine and Microlite can be fitted quickly around the duct and supporting hangers. Light-gauge wire ties complete the job.



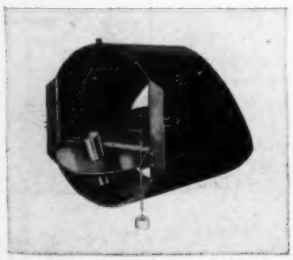
Because Field Controls are round they can always be leveled, regardless of the angle of the flue pipe.

The first name in heating is yours

To most home-owners the name of their dealer is more familiar and more important than the name of their furnace. Consumers know that a good dealer will not install poor equipment. And we know that, too. For you have proven your loyalty to quality through more than 15,000,000 Field Draft Control installations.

field

FIELD TYPE M—6″ through 32″ sizes for oil and coal fired domestic and commercial furnaces and boilers.



FIELD TYPE M G—6″ through 32″ sizes for gas fired commercial heating plants — approved by leading gas companies and engineers from coast to coast.

DESIGNED FOR MAXIMUM CAPACITY

The Field R-C illustrated above and to the right shows the great reserve capacity available to meet any emergency condition. So great is this capacity that, for example, a 7″ control is often used on an 8″ pipe, yet the control is sensitive to draft variations as fine as .01″. Made in 7″ and 9″ sizes for flues from 6″ through 10″.

FIELD CONTROL DIVISION
of H. D. CONKEY & COMPANY, Mendota, Illinois

Affiliates { CONCO BUILDING PRODUCTS INC • Brick, Tile, Stone
CONCO MATERIALS HANDLING DIVISION • Cranes, Hoists

NEW HOME? OLD HOME? BIG HOME? SMALL HOME?

Worthington air conditioning fits them all!

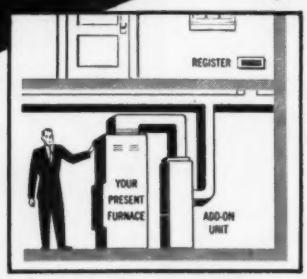
NEW HOME, NEW AIR CONDITIONER. That makes good sense for you *and* your customer — when the air conditioner is a Worthington *year-round* residential unit. This good-looking package sends cool, dry, filter-clean air to every room in summer . . . healthfully-humidified, *balanced* heat in winter. And it takes up less than 8½ square feet.

Sure Worthington can handle any air conditioning job — residential *or* industrial. There's more to a Worthington franchise than that, however. Worthington's big-money national ad campaign, heavy promotional back-up, and in-the-field sales promotion specialists spell success for every Worthington dealer. For the full story, write today to Worthington Corporation, Air Conditioning and Refrigeration Division, Section A.5.48-A, Harrison, New Jersey. A.5.48

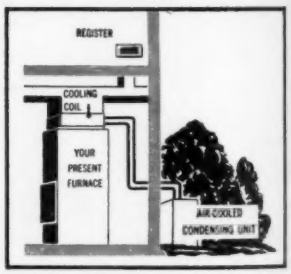
WORTHINGTON

The Best Franchise . . . The Most Complete Line

System for every need

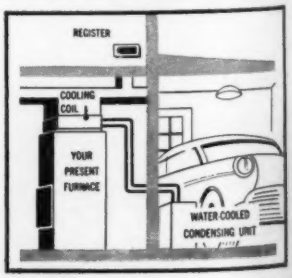


FOR HOME WITH WARM-AIR FURNACE, install a Worthington Add-On Unit for filtered, comfort-conditioned air all year 'round. Installation is easy. For extra air delivery, mount a Worthington fan section on top of add-on unit.



WATER SCARCE? Don't let that spoil a sale! Worthington's air-cooled condensing unit is all electric — *needs no water at all!* Hooks into warm-air furnace, goes outdoors, in garage or breezeway. 2, 3, or 5 hp sizes.

SHORT ON SPACE? Here's the answer to that problem — Worthington's new Packaged Water-Cooled Condensing Unit. This compact, adaptable unit goes anywhere — closet, basement, attic, even the garage. Use it with Worthington's Remote Duct Cooling Coil for existing homes or new construction.



NEW EASY TO INSTALL, EFFICIENT

KRITZER

WARM AIR BASE BOARD

Made by the world's largest exclusive manufacturer of Baseboard Heating Products

Kritzer, in the Baseboard Heating field, means the best in materials, design, workmanship, and performance! Now, famous Kritzer engineering and manufacturing provides:

1. The same qualities in **AIR BASE.**
2. A profit-making product to warm air jobbers and dealers.

KRITZER AIR BASE is made of heavy gauge steel for a lifetime of use.

KRITZER AIR BASE is easy to install with snap-on covers and integral balancing damper.

KRITZER AIR BASE design will fit any style of interior.

KRITZER AIR BASE is available in a wide range of standard sizes.

Write today for **KRITZER AIR BASE** Bulletin No. 700. Learn more about this NEW, quality Warm Air Baseboard.

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KRITZER
RADIANT COILS, INC.

2901 LAWRENCE AVENUE · CHICAGO 25

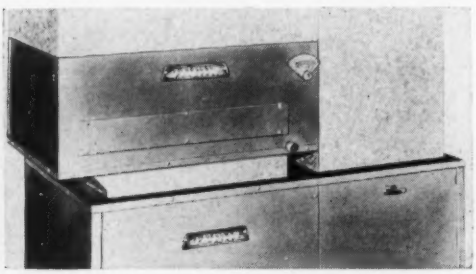
"IF IT'S KRITZER, IT'S RIGHT, SIR!"

EQUIPMENT DEVELOPMENTS

The latest information on manufacturers' developments is presented here with brief summaries of the applications of these products. For additional product information which is available, see this month's New Literature department.

Cooling Coil and Casing

TYPE 912 horizontal coil air conditioning unit which can be built into the heating unit ductwork for summer cooling — Mueller Climatrol, 2005 W. Oklahoma Ave., Milwaukee 15. Casing may be installed in the



plenum assembly above the furnace; coil, along with remote air or water cooled condensing unit can be installed later. Available in 2 or 3 hp, the unit is designed for installation with remote condensing unit for application where space is at a premium. Unit measures 12 5/8 in. high, 29 3/4 in. wide, 20 3/4 in. deep. Featured is built-in bypass damper designed to control excess humidity.

Flux for Submerged Arc Welding

LINE OF agglomerated fluxes for automatic submerged arc welding of low alloy steels — Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17. Fluxes contain alloying elements which may be changed as required by the particular job for which the individually compounded flux is made. They can be used with mild steel electrode and are said to produce a low alloy deposit which can be varied. Fluxes can be compounded to produce weld metal containing the following elements in varying amounts: chromium, molybdenum, vanadium and nickel. The agglomeration process is said to permit compounding of fluxes to meet the requirements of a weld deposit regardless of how specialized the application may be.

Horizontal Furnaces

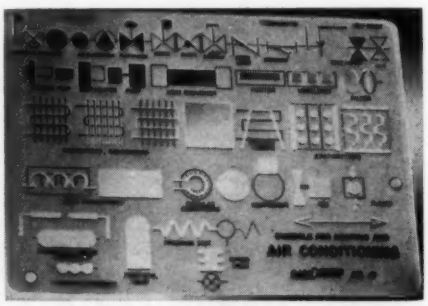
HORIZONTAL FURNACES in five sizes ranging from 60,000 to 140,000 Btu input — Temco Inc., 4104 Park Ave., Nashville 9, Tenn. Furnaces can be adapted to right or left hand units in the field. Heavy gage steel heating unit and rubber mounted motor are featured. Controls are preassembled. Support channels are provided with the unit for overhead suspension or base mounting.

Residential Air Conditioner

AIR CONDITIONING units in 2 or 3 ton sizes employing "soaker coil" designed to cool homes in the same manner as the evaporative cooling of the human body — Harvey Hill, Inc., 2209 Lynch St., St. Louis, Mo. According to the manufacturer, heat absorbed from the refrigerant in the coils passes through a coil which is surrounded by a porous jacket of nylon or plastic; water is circulated inside the space between jacket and tubing, allowing some of the water to be absorbed in the jacket and emerge to the outer porous lining where it evaporates and cools the jacket. The jacket cools the water which has the same effect on the refrigerant. Air coil also works in conjunction with the "soaker coil" as a complementary action. The company also states that 2 ton unit cools an average five room house using only 9 gallons of water per day.

Heating, Air Conditioning Template

NO. 41 air conditioning and heating template grouping of standard symbols — Rapidesign, Inc., Box

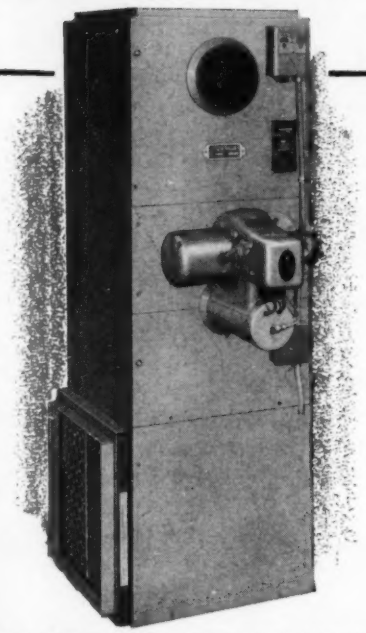


592, Glendale, Calif. Derived from ASA Z32.2.3 and ASA A32.2.4, template is of 0.030 matte finish plastic in 7 × 5 in. All cutouts are precision cut for smoothness of line and ease of use in heating and air conditioning drawings and other applications, the company reports.

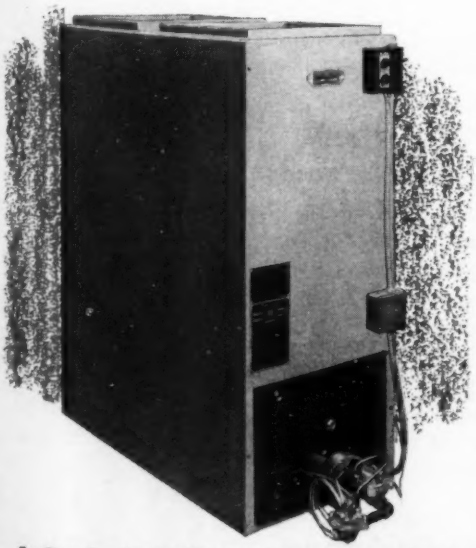
Pressure Regulators

MODEL H-200-75 in-line and angle type pressure regulators said to be suitable for all gases and capable

Sell these modern fluid heat *quality* heating units priced for your builder trade!



Oil-Fired Hi-Boy Oil Model SU-84: 63¾" high, 21" wide, 35" long (incl. burner); 84,000 BTU/hr. output. Also available: Hi-Boy Model SU-112: 67⅛" x 23½" x 37½" (incl. burner); 112,000 BTU/hr. output. Both UL approved. Also available in gas-fired units of comparable capacities.



Lo-Boy Gas Model GL-9: 53" high, 21" wide, 51" long (incl. burner); 90,000 BTU/hr. input, 72,000 BTU/hr. output. AGA-approved for use with natural, mixed, manufactured or LP gas. Also available in comparable capacity oil-fired unit—Model B-84.

Here's what you can offer builders!

- **Rock-bottom prices with no drop in famous Fluid Heat quality!**
- **Wide range of models and sizes!**
- **Prestige of a top name in the industry!**
- **Satisfied customers, with no comebacks!**

Here's a new line of Fluid Heat heating units, designed specifically for the building trade. Each unit boasts the same Fluid Heat quality features and top construction as always—only the frills have been left off. And the price has been cut 'way back to put you in a favorable competitive position. If you are looking for a good connection, it will pay you to mail the coupon for more details!

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AUTOMATIC HEATING EQUIPMENT
"WORLD'S ECONOMY CHAMPION"

CLIP COUPON NOW FOR FULL DETAILS

ANCHOR POST PRODUCTS, INC., Fluid Heat Div.
6720 Eastern Ave., Baltimore 24, Md.

I want to become a Fluid Heat Dealer. Send me details on the complete line.

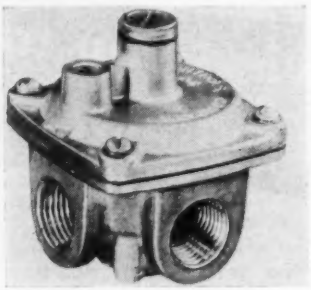
Company Name.....

My Name.....

Address.....

City.....Zone.....State.....

of handling inputs to 88,000 Btu natural gas — Major Controls Co., Highway 71 and Yorba Rd., P.O. Box 537, Corona, Calif. Aluminum alloy castings are lightweight and corrosion resistant; guide posts



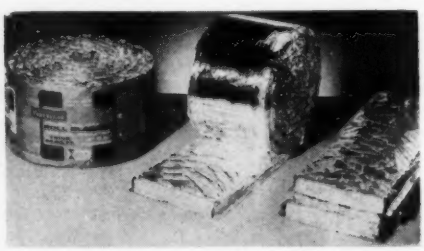
are integrally cast to secure the nylon fabric diaphragm in place for concentricity and correct diaphragm movement, according to the manufacturer. Vise-grip bosses are utilized in lower casting to facilitate production. Optional heights are 2 15/16 or 3 3/16 in.

Basement Furnace for Small Homes

"SUN FUEL-MASTER" Model OH-7065 basement furnace for small residences — J. V. Patten Co., 550 DeKalb Ave., Sycamore, Ill. Unit measures 22 × 36 × 52 in. Rectangular combustion chamber has heat chute and drum radiator. Primary and secondary heat exchanger are in continuous arc-welded sections; primary section is the combustion chamber with combination combustion baffle and heat accelerating tube surrounded by products of combustion. Secondary heat exchanger consists of a 10 in. heating drum with 6 in. vent pipe and extends through the return air section of the furnace casing. Unit delivers 80,000 Btuh; 1/6 hp motor drives 9 in. diameter centrifugal blower.

Residential Building Insulation

"FIBERGLAS" foil enclosed residential building insulation which can be cut with a knife or shears and nailed



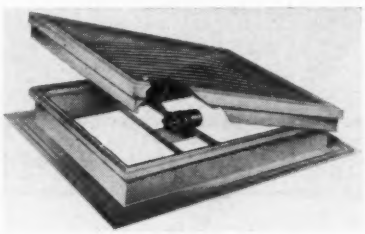
or stapled to wall studs by using nailing flanges along the sides — Owens-Corning Fiberglas Corp., 1930 Nicholas Bldg., Toledo 1, O. Developed in cooperation with Aluminum Co. of America, the mineral wool insulation has aluminum foil on both sides for reflection of radiant heat. Insulation is in roll and batt blankets in widths of 15, 19 and 23 in. and thicknesses of 2 and 3 in. Roll blankets are in lengths up to 60 ft; batt blankets are 4 ft long.

Packaged Air Conditioner

SELF-CONTAINED floor model air conditioning units in 3, 5, 7½, 10 and 15 tons, rated from 36,000 to 180,000 Btuh — American Blower Corp., Detroit 32, Mich. Three smaller models have one compressor and one fan, two larger units have two of each. Nominal cfm rating ranges from 1200 to 6000. Motors and compressors are hermetically sealed as single units. Filters are replaceable; condensate collecting device is said to keep filters dry and prevent re-evaporation. Water cooled condenser permits use of city water or cooling tower.

Ventilating Skylight

"MARCOLITE" ventilating skylights with manual or remote control — Marco Co., 45 Greenwood Ave., East Orange, N.J. Self contained curb and roof flange



are designed to eliminate use of additional flashing. Featured are extruded aluminum frame and glass fiber panels.

Suspended Furnaces

SERIES 8801-LB "Space Saver" suspended furnaces rated at 225,000, 275,000 and 350,000 Btuh — Armstrong Furnace Co., 851 W. Third Ave., Columbus. Designed for suspension in usable areas, units are 29 in. high, 65½ in. long; larger model is 63 in. deep, others are 44 in. Combustion chamber and secondary heat exchanger tubes are built in "tear drop" design said to permit blower air to be wiped over the entire surfaces of the tubes and chamber for maximum heat transfer into the air stream.

Plastic Diaphragms

"FLUOROFLEX-T (TEFLON)" special purpose diaphragms for valves, controls, process and other equip-

Profit by personalized selling tools!

Most complete selling literature lineup in the industry, to help you "be Mr. B" in your city. Personalized with *your name* and BRYANT sales message, of course.

be "Mr. B"

(AUTHORIZED BRYANT HOME COMFORT DEALER)

Only "Mr. B"—the Bryant Home Comfort Dealer—has *all 8* of these selling assets to build his business BIG:

1. A name customers know and want
2. The most complete line of automatic heating, air conditioning, water heating
3. Quality equipment for every market
4. Exceptional distributor service
5. Professional sales training
6. Personalized selling tools for you
7. National advertising featuring you
8. Co-op "Mr. B" ads for local papers

For bigger profits now, for a secure and prosperous future—see your Bryant Distributor. Ask him about Bryant's big "Mr. B" action program, and how it can make sales and money for you!

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AUTOMATIC HEATING
AIR CONDITIONING
WATER HEATING

ANNOUNCING
A New 5-Foot Joint
SUPERIOR
Spee-D-Lok
FURNACE PIPE

One Piece

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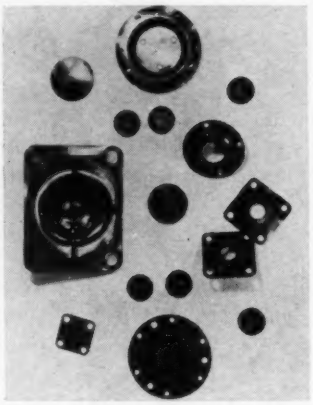
A COMPLETE LINE
OF STANDARDIZED
GALVANIZED FITTINGS

● Save your heating contractors still more time, material and money with the new 5-foot length Spee-D-Lok galvanized furnace pipe. The same "tongue-in-groove" locking feature as Superior's popular accepted 2-foot length with the seam running the full 5-foot length of the pipe eliminates tooling and malleting. It's ready for use when they buy it. Just slip the tongue in the groove until it snaps! It cuts without damaging the locking edges. Cartons contain 10 5-foot joints. Superior color gauge system marks every size for quick, easy identification. Write for color chart.

See Your Wholesaler
Write for Our Catalog

SUPERIOR METAL FABRICATING Company
NILES, OHIO

ment — Resistoflex Corp., 39 Plansoen St., Belleville, N.J. Made from chemically inert fluorocarbon resins, the diaphragms are designed for applications involving



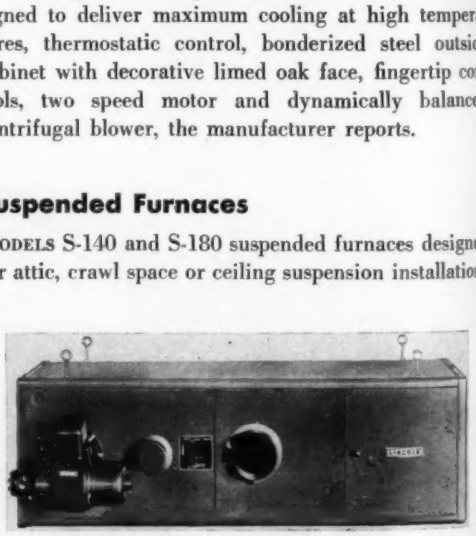
acids and caustics, foods and drugs, hot lacquers, steam, synthetic oils, jet fuels, gases and vapors under extreme conditions of temperature, the company reports.

Room Air Conditioner

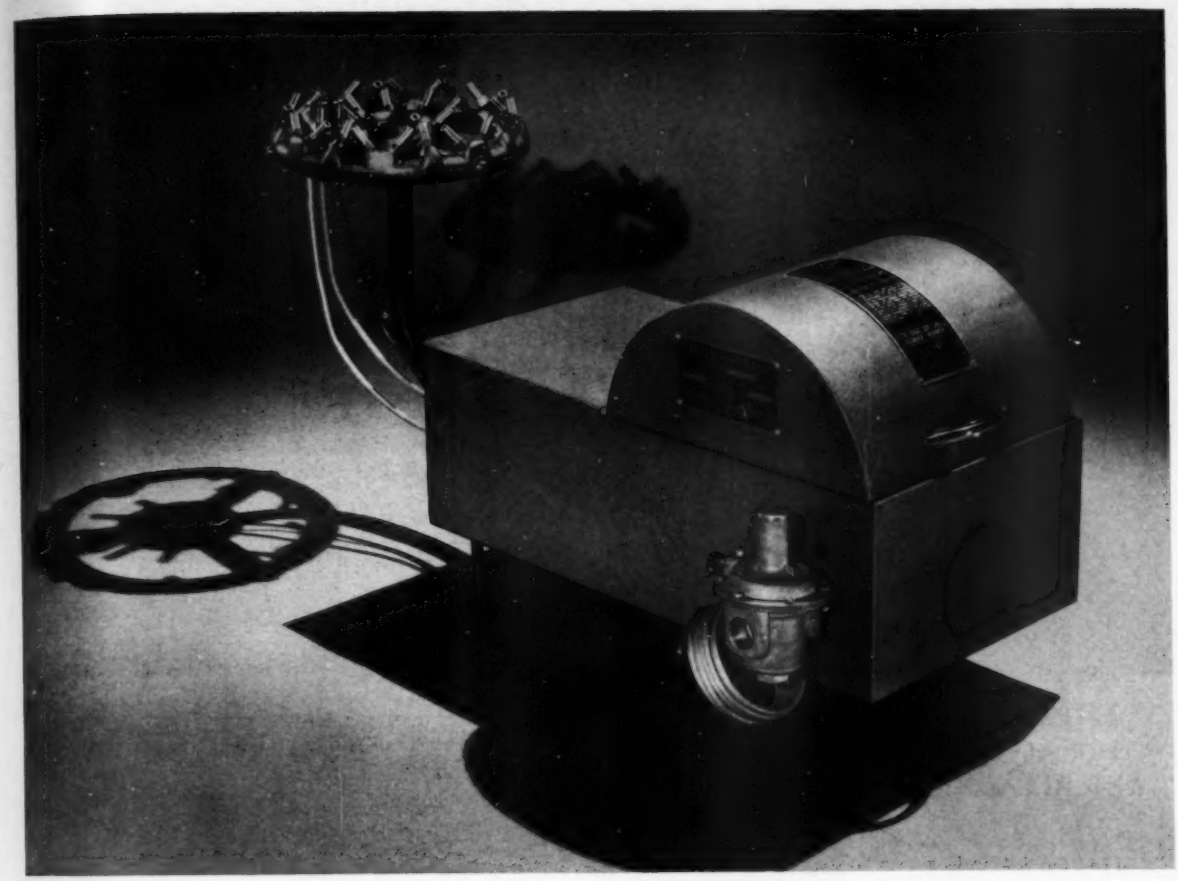
"Cool-A-Matic" window mounted room air conditioner in ¾, 1, and 1½ ton models — Automatic Firing Corp., 4417 Oleatha Ave., St. Louis 16, Mo. Units are rated at 9000, 12,000 and 18,000 Btu. Featured are two cylinder compressor and oversized coils designed to deliver maximum cooling at high temperatures, thermostatic control, bonderized steel outside cabinet with decorative limed oak face, fingertip controls, two speed motor and dynamically balanced centrifugal blower, the manufacturer reports.

Suspended Furnaces

Models S-140 and S-180 suspended furnaces designed for attic, crawl space or ceiling suspension installations



— Lincoln Furnace Co., Inc., 230-44 Goffle Rd., Hawthorne, N.J. Rated at 140,000 and 180,000 Btuh repectively, the packaged units can be fired from either side; flue outlet can also be located on either



Barber Jets: Still the most efficient conversion burners

All heating men know that the best burner is the one that burns hottest at the lowest possible level in the combustion chamber. And we think that no other burner can meet these basic requirements as well as the new Barber TP burners with their tried-and-true precision impinged jets.

To get the hottest flame, we first make sure the primary air-gas mixture is right. Drilling our orifices to 1/1000 of an inch tolerances makes this possible. Then we tilt the jets to just the right angle to each other to draw in a precise amount of secondary air. A very hot 1900° F. flame is the result . . . and it is hottest right over the jets . . . low in the chamber.

But that isn't all. Barber TP's are not only efficient but they also feature quick, quiet ignition and shut-off. Since there isn't any venturi tube, there isn't any flash-back.

What's more, they're easy to install and only the controls ever need servicing. For example, no adjustment of primary or secondary air is necessary because each jet is drilled at the factory to use the particular gas in your area.

There are tens of thousands of Barber jet burners in use. *Write today for specifications and prices on the new TP to the address below.*

THE Barber MANUFACTURING COMPANY
GAS AND OIL BURNER DIVISION
3701 Superior Avenue, Cleveland 14, Ohio • HE 1-6045

NATIONAL LOCK

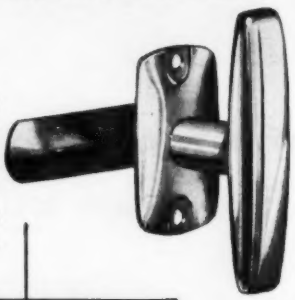
makes the hardware that makes the difference in user appeal of your products

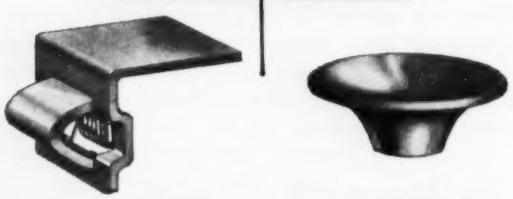
Made of Steel. Available in standard plated or enamel finishes.

ATTRACTIVE, DURABLE HARDWARE FOR ACCESS PANELS ON FURNACE AND AIR CONDITIONING EQUIPMENT

61-366 LATCH

Assures attractive styling coupled with positive latching action. Regularly supplied in bright Nickel and bright Chrome plated finishes.





61-3319 CATCH

Easily applied for a variety of applications on metal cabinets. Plain Steel and Cadmium plated finishes.

63-X3017 KNOB

Concave face. Hollow metal construction. Made of wrought Steel. Standard plated or enamel finishes.

Write for complete information

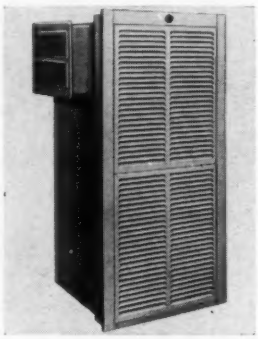
NATIONAL LOCK COMPANY
Rockford, Illinois

equipment developments (Continued)

side. Designed for small space applications, the furnaces are 22 and 24 in. high. Units are of 12 gage steel.

Recessed Wall Heater

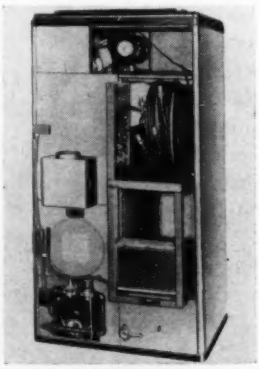
MODEL C-70-GA gas fired vented recessed heater designed mainly for Southern homes — Morrison Steel Products, Inc., 601 Amherst St., Buffalo 7, N.Y. Unit



fits into the wall so only the louvered grille is visible. Unit is adaptable for side wall or corner installation. Design permits installation of type B chimney vent. Capacity is 70,000 Btuh input.

Year 'round Air Conditioner

COUNTERFLOW year 'round air conditioning unit designed for installation in the utility room or closet and for use with perimeter air distribution systems — C. A. Olsen Mfg. Co., Filbert St., Elyria, O. Cooling coil is installed in a vertical position within the furnace



cabinet to provide efficient drainage of condensate water away from the cooling coil and to prevent redistribution of moisture into air ducts and living areas, the manufacturer states. Choice of 2 ton hermetically sealed, air cooled remote refrigerant circuit or water cooled refrigeration circuit is provided in combination with 100,000 Btu input gas or oil heating. Equipped

HEATWAVE • HEATWAVE • HEATWAVE • HEATWAVE • HEATWAVE • HEATWAVE

AMERICA'S—— Best Furnace Values AMERICA'S—— Top Profit Line

Whatever the heating problem, HEATWAVE provides the answer in a type and size that meets every requirement of each particular installation!

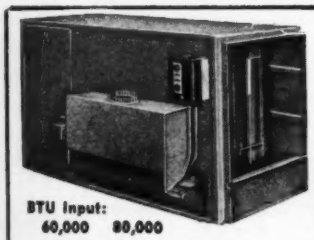
Plus...

SOUTHWEST YEAR-ROUND AIR CONDITIONERS

Southwest manufactures a complete line of 2 and 3-ton Residential Air Conditioners for use as companion units with any Forced Air Furnace.

HEATWAVE GAS FIRED FURNACES

Build Additional Sales and Maintain Goodwill!



BTU Input: 60,000 80,000

THE HEATWAVE HORIZONTAL

for space saving installations in homes without basements; installs in attics, under floors, in service porches, attached garages; suspends from joists in homes with basements.

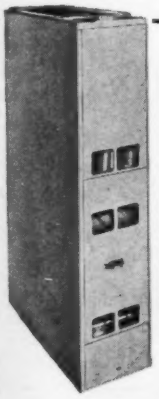
THE HEATWAVE HI - BOY

designed to meet the need of better home heating at lower cost. Completely automatic. Built-in draft diverter. Cast iron burner. Gets you more sales, more profit.

BTU Input: 80,000, 100,000, 120,000, 140,000 and 160,000.

EVERY HEATWAVE MODEL:

- Factory Assembled
- Fire Tested
- Ready to Install
- 10-Year Factory Warranty



THE HEATWAVE Counter-Flo

for perimeter and under floor heating; can be installed in closet, alcove or utility room with minimum of duct work. Very economical installation.

BTU Input: 80,000 100,000; 120,000

THE HEATWAVE FLOOR FURNACE

BTU Input: 27,500 35,000 50,000 65,000 75,000

accomplishes the long-sought objective in floor furnace manufacture: QUIET operation, combined with efficiency, economy and long life.

HEATWAVE Vented, Recessed WALL HEATER

New, improved, finest Heatwave quality! Fits in 16" centered stud spacing. Ideal for homes, apartments, offices, stores and motels. Minimum installation cost.

BTU Input: Single Wall, 25,000 and 35,000; Dual Wall, 35,000 and 45,000.

DISTRIBUTED BY OUTSTANDING WHOLESALE SUPPLY HOUSES

WRITE OR WIRE — GET THE FACTS

HEATWAVE SOUTHWEST MANUFACTURING COMPANY

BOX 28 Subsidiary of the F. E. Myers & Bro. Co. AURORA, MO.

for water cooling, entire refrigerant circuit is installed within furnace cabinet; for air cooling, only the cooling coil is installed within the cabinet. The 30 or 50 ft. lengths of refrigerant tubing connect to a remote condensing unit containing an air cooled condenser and blower assembly.

Year 'round Thermostat

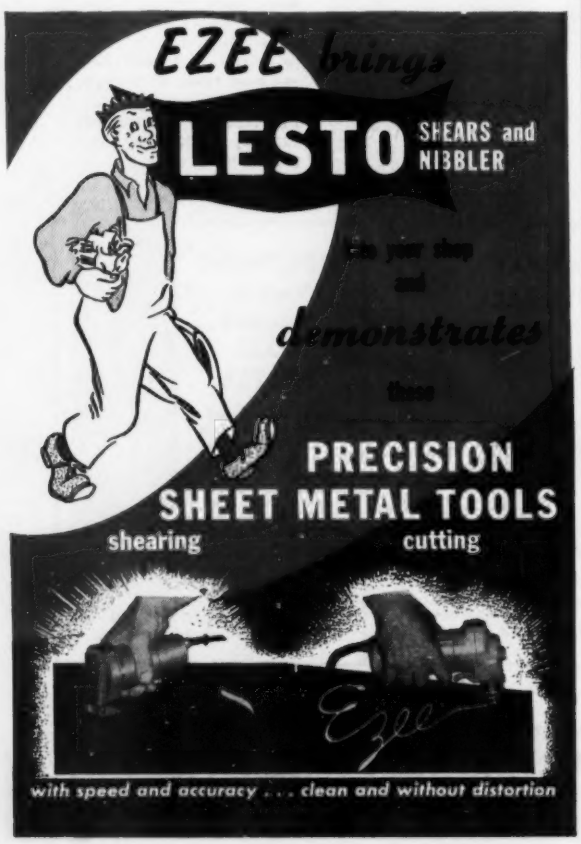
"DUO-CLASSIC thermostat designed for year 'round air conditioning systems — Detroit Controls Corp., 5900

Trumbull Ave., Detroit 8. Single switch controls heating, cooling and air circulation. Unit is designed for use with the company's "Universal Control" panel for combination heating and cooling systems. Thermostat is designed to blend with interior furnishings, with gold-colored case and black dial.

Oil Furnaces

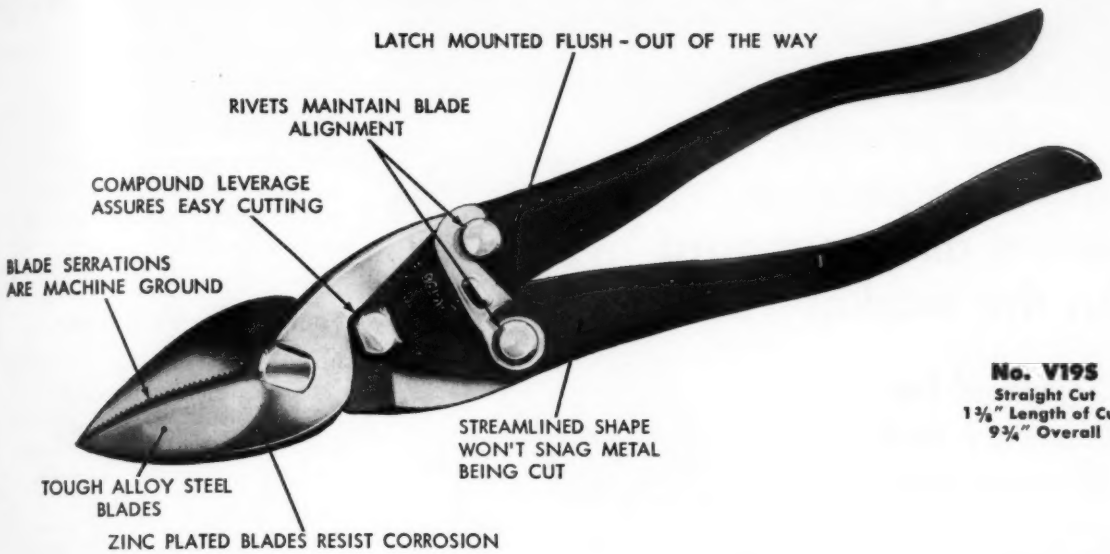
REVISED MODELS of ORA furnace series in bonnet ratings of 85,000, 105,000, 130,000 and 155,000 Btu — Toridheet division, Cleveland Steel Products Corp.,

16025 Brookpark Rd. Cleveland 11, O. Revisions include round cornered cabinet with new louver design in removable front panel of a vestibule enclosing burner controls; constant level valve mounted inside vestibule which is said to deliver uniform oil flow to accelerate ignition.



H&C
KWIK-WAY DAMPER
REGULATOR SETS
ONE SOLID
HAMMER BLOW
SETS THE BEARING
PERMANENTLY
SECURE,
RATTLE-
PROOF!
No anvil required. Both bearings have retractable bolts for easier installation. Their convenience and time saving characteristics makes them by far the most economical sets when installed costs are considered. See your jobber or write for literature.
HART & COOLEY MANUFACTURING CO.
500 EIGHTH STREET HOLLAND, MICH.
IN CANADA: HART & COOLEY MFG. CO. FORT ERIE, N., ONTARIO

CRESCENT AVIATION SNIPS


LATCH MOUNTED FLUSH - OUT OF THE WAY
RIVETS MAINTAIN BLADE ALIGNMENT
COMPOUND LEVERAGE ASSURES EASY CUTTING
BLADE SERRATIONS ARE MACHINE GROUND
STREAMLINED SHAPE WON'T SNAG METAL BEING CUT
TOUGH ALLOY STEEL BLADES
ZINC PLATED BLADES RESIST CORROSION

No. V19S
Straight Cut
1 3/8" Length of Cut,
9 3/4" Overall

Distinguished by CRESCENT'S exclusive streamlined design, these new Snips have many outstanding features. Alloy steel blades have extraordinary hardness and toughness and keen edges with machine ground serrations which can be factory reground. Compound leverage produces tremendous blade power with ordinary handle pressure.

Made in three patterns: V19S, straight cut, V19L, left hand which cuts to the right, and V19R, right hand which cuts to the left. All have zinc plated blades and parkerized handles. Neoprene Insulating Sleeves are available separately or installed.

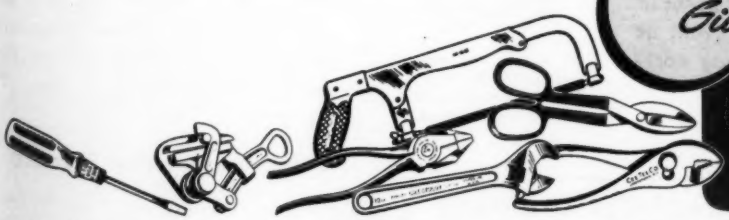
New CRESCENT SCRATCH AWL WITH TENITE HANDLE

Four inch fine steel blade hardened full length — can be easily and repeatedly resharpened.

No. 74
Tough, Blue
Tenite Handle

Sold by Hardware Dealers and Industrial Distributors Everywhere.

CRESCENT TOOLS
Give Wings to Work
®
Sign of the Artisan Symbol of Excellence



Crescent is our trade-mark, registered in the United States and abroad, for wrenches and other tools. Sold by leading distributors and retailers everywhere and made only by
CRESCENT TOOL COMPANY, JAMESTOWN, NEW YORK

VULCAN
AIR≈TRIM
warm air baseboard

. . . the newest, most competitive warm air baseboard on the market

Designed for Economy and Performance

Top efficiency *plus* economy assured through easy-to-install baseboard that distributes warm air evenly over extended wall areas. Eliminates wall "streaking" and "scorching" of drapes and curtains.

Styled for Beauty

Yes—outstanding in style and beauty because its fashioned after Vulcan's famous TRIMLINE design, the choice of discriminating homeowners.

Designed and Styled to help you SELL MORE . . . PROFIT MORE

The distinctive design helps to make your selling job easier. Smarter looking, more attractive, AIR-TRIM pays you a bonus in increased sales. And its packaged for easy stocking 2, 4, 6, 8 and 10 ft. lengths.

Write now for your AIR-TRIM Bulletin. Data and installation instructions included.

ORIGINATORS OF FIN-TUBE AND BASEBOARD RADIATION IN AMERICA

The VULCAN Radiator Company
775 Capitol Avenue • Hartford 6, Conn.

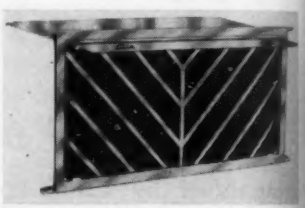
equipment developments

Oil Burner Nozzle Cap

NOZZLE CAP designed to permit quick, easy identification of fuel oil nozzles — Wm. Steinen Mfg. Co., 43 Bruen St., Newark, N.J. For solid cone spray nozzles a blue cap with white markings is employed on the plastic container; for hollow cone spray nozzles a red cap with white markings is used.

Foundation Ventilator

No. 441 cast aluminum foundation ventilator with floating damper — Leigh Building Products division, Air Control Products, Inc., Coopersville, Mich. Damper, which has no



pivots, covers entire face of the ventilator from outside; two locks prevent damper from rattling. Featured are "speed wall" fins which completely surround the frame in the margin of the casting. Eight mesh aluminum screen is included. Free area is 81.8 sq in. Unit is also available without damper.

Soldering Flux

"LA-CO FLUX" soldering flux in 2 oz can to accommodate users who have only occasional need for such a product — Lake Chemical Co., 3052 W. Carroll Ave., Chicago 12. Self-cleaning, non-acid flux can be used with 40-60, 50-50, 60-40, and 95-5 solders; flux is said to flow by capillary action through surface film and disperse metal oxides.

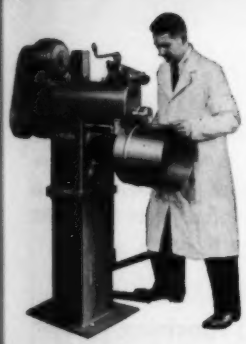
Oil Fired Gravity Furnace

MODEL OG-115 oil fired gravity furnace designed for basement installation in larger homes and rated at

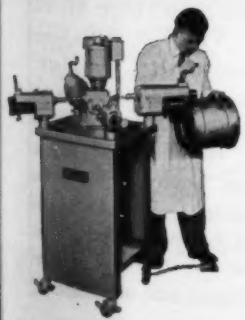
New Deep Throat Combination Rotary Machine added to versatile, popular Niagara line

12 MACHINES IN ONE!

No. 150 Hand Operated
Deep Throat Combination Machine



No. 180 Power Operated
Deep Throat Combination Machine



No. 104 Multi-Drive Power Table
for Motorizing Hand Machines

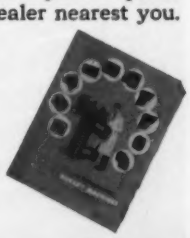
Variety of models, versatility, ruggedness, operating ease, low-cost service and modern design have *for years* made Niagara Rotary Machines *the preferred line.*

And now, the new and improved No. 150 Deep Throat Combination Hand Machine joins the famous Niagara Rotary family.

Truly, it is 12 machines in one. Readily equipped with 12 different pairs of standard rolls (carried in stock), it is without equal for efficient and profitable turning, burring, wiring, elbow edging (3 types), single beading, OG beading, crimping, furnace collar edging, body flanging, slitting and trimming operations. For utmost convenience, work can be fed in either direction with the same, clockwise cranking. *Here's a multi-purpose machine that will turn out real profits for you!*

In sheet metal shop or industrial maintenance, Niagara is the Rotary Machine Line that has the most to offer. Power and hand operated models of varied types and work capacities, plus a wide range of forming rolls, make Niagara the only name you need remember to meet *all* your requirements. Write for new Bulletin 75 and the name of the dealer nearest you.

FULL LINE PRESENTED IN COLORFUL NEW BULLETIN 75
Here are 24 pages chock-full of information, including a helpful Selection Chart for picking the right machines and rolls.



NIAGARA MACHINE & TOOL WORKS, BUFFALO 11, N. Y.
DISTRICT OFFICES
Buffalo • Cleveland • Detroit • New York • Philadelphia
Dealers in principal U. S. cities and major foreign countries

NIAGARA ROTARY MACHINES
POWER AND HAND OPERATED

America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

GAS-FIRED UNIT HEATERS

by *Modine*

save you money right from the start

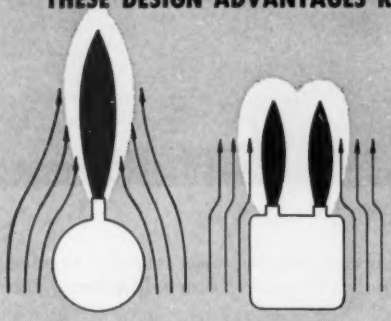
Lightweight cuts shipping, installation costs

WEIGHT COMPARISON

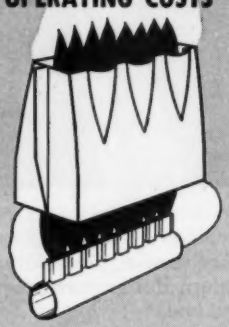
Brand	Capacity (Btu/hr. input)	Approx. Net Weight
Modine (aluminized steel)	105,000	105
Modine (stainless steel)	105,000	95
Brand "A"	100,000	170
Brand "B"	102,000	196
Brand "C"	90,000	175
Brand "D"	100,000	165
Brand "E"	100,000	210
Brand "F"	100,000	210
Brand "G"	105,000	170

Light weight, without sacrifice of strength or efficiency, makes Modine Unit Heaters easier to handle, faster to install. Also cuts need for expensive support structures.

THESE DESIGN ADVANTAGES REDUCE OPERATING COSTS



More usable heat per fuel dollar
Single-row burner ports help insure adequate secondary air supply. As a result, you get maximum combustion efficiency, more deiivered heat per fuel dollar.



Faster, more uniform heating
Continuous flame from front to rear of individually-fired exchangers, increases radiant heat absorption, uniformly distributes heat through tube.

LONGER LIFE . . . AND . . . LOW-COST SERVICE

Stainless steel slashes corrosion loss
Modine burners, to all practical purposes, are unaffected by acid corrosion, rusting and scaling . . . give you many years of trouble-free, top efficiency.

GU-1270

NEW 12-PAGE BULLETIN 655
gives you more complete information, selection and application data. Call the Modine representative listed in your classified phone book. Or write — Modine Mfg. Co., 1580 DeKoven Ave., Racine, Wisconsin.

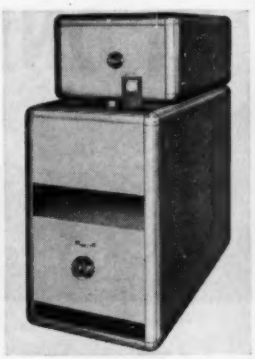
Modine
UNIT HEATERS

equipment developments

115,000 Btu — Perfection Industries, Inc., 7609 Platt Ave., Cleveland 4. Pressure-atomizing burner operates on no. 2 fuel oil; burner is on rubber cushions; casing is heavy gage steel, insulated with aluminum and spun glass liners and reinforced by "rainbow" stiffeners. Fuel and air connection can be made on either side of the unit.

Residential Air Conditioner

AIR AND WATER cooled remote compressor home air conditioners with cooling coil mounted atop forced air furnace unit — Century Engineering



Corp., 401 Third St. S.E., Cedar Rapids, Ia. Air cooled models have separate remote condenser also. Cooling coil unit is said to be easily installed and uses the same ducts, as well as blower and filters as the heating system.

Insulating Machine Feeder

FEEDER DESIGNED to enable insulation applicators to select best blowing speed for each insulation job — Universal Insulating Co., Dept. 11, 333 S. Walnut St., Van Wert, O. Designed for the company's "Uni-Matic" models, feeder is said to permit application of 15 to 60 bags of insulation per hr. Hinged baffle adjusts feeder opening to any required size from 5 × 12 in. to 8 × 12 in. All steel unit has removable end plates; open end rotor is steel with rubber seals on ends and side of blades.

Fasten it with STAINLESS STEEL

for Better Looks – Longer Life

LEADING PRODUCERS OF FASTENERS USE ALLEGHENY METAL

A complete line of stainless steel fasteners—all types and sizes of bolts and nuts, rivets, wood and machine screws, cotter pins, washers, etc.—are made of Allegheny Metal by the leading manufacturers in this field. Get in touch with them for catalogs and prices, or write us direct.

ADDRESS DEPT. AA-68

Allegheny Metal fasteners are non-rusting, non-staining. They will last as long as, or longer than, the materials they join. You can count on them to stand up through the years—both in strength and in bright good looks.

Best of all, stainless steel fasteners can be used anywhere. It isn't necessary that the materials to be joined are stainless—these corrosion-proof fasteners are the perfect answer for joining other metals, woods, or plastics.

Fasteners made of Allegheny Metal are produced in complete variety—every type and size that your job requires.

For improving quality and reliability wherever they're used—and for the economy of lifetime service—specify fasteners made of the time-tested stainless steel, *Allegheny Metal.* ● For any technical data or engineering help in the use of stainless steel, address *Allegheny Ludlum Steel Corporation, Henry W. Oliver Bldg., Pittsburgh 22, Pa.*

You can make it **BETTER** with

Allegheny Metal

WAD 3590

TIME-TESTED STAINLESS STEEL

UNXLD QUADRANT
Formerly Manufactured by
PARKER-KALON... Now
Made by DURO-DYNE

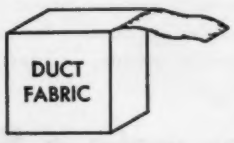
BIG RESPONSIBILITY!

Since Parker-Kalon introduced the UNXLD Damper Quadrant more than 30 years ago, it has been accepted as the standard by leading architects, engineers and sheet metal men throughout the world. Manufacture and sale of the Unxld Quadrant, as well as the "Jiffy" and Dial Regulators, plus more than 100 other P-K items, was a big responsibility recently undertaken by the Duro-Dyne Corporation. Duro-Dyne is upholding the famous P-K tradition of dependability and performance.

That tradition is exemplified by Duro-Dyne's *complete line of flexible duct connector products. Preassembled* types include DURO-METAL-FAB for heavier gauge ductwork, and ECON-O-FAB for residential and lighter gauge ductwork. DURO-METAL-FAB and ECON-O-FAB eliminate the nasty job of attaching fabric to metal. Both have the exclusive Double-Loc metal-to-fabric seam which prevents the fabric from pulling out or being cut by the metal when the finished connector vibrates.

When quality fabric without metal is desired, Duro-Dyne's high quality DUCT FABRIC fills the bill. Choice of 6" and 10" wide canvas, 6" wide asbestos and neoprene. Packed 100 ft. roll per handy dispenser carton.

Whatever your Flexible Connector needs, Duro-Dyne can fill them with DURO-METAL-FAB, ECON-O-FAB or DUCT FABRIC. Available where you buy your UNXLD QUADRANTS—at your local PK-Duro-Dyne Distributors.

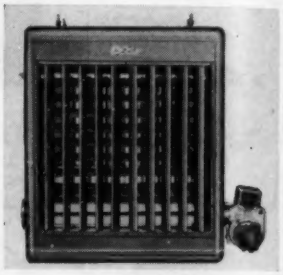


DURO-DYNE Corporation
800-B Third Ave.,
New Hyde Park,
New York

equipment developments

Oil Fired Unit Heater

SERIES UHE oil fired unit heater with galvanized steel frame around propeller fan and motor assembly, designed for assembly to the ductwork — Delta Heating Corp., 1



Cole St., Trenton, N.J. Service doors are at both sides of enclosure; standard louvers or flanged front are optional. Series ranges from 110,000 to 280,000 Btuh output. Units may be suspended from the ceiling or base mounted.

Home Air Conditioners

UN SERIES 2 and 3 ton air conditioning units rated at 25,000 and 37,500 Btuh respectively — King Refrigerator Corp., 7602 Woodhaven Blvd., Glendale, L.I., N.Y. Air cooled condenser is part of hermetic assembly; evaporator is placed in a slot in the ductwork of the existing warm air heating system; cascade arrangement for rapid removal of condensation is a feature, the company states. Units have access panels on both sides. "Oversize" evaporator and condenser coils are other features claimed by the company.

Protective Coating

"CORROCOTE No. 362" neoprene base protective coating designed to protect metal, wood, concrete and other materials against moisture, oils, chemical fume and splash, salt air and fungus corrosion — Chemical Coatings & Engineering Co., Broomall, Pa. Applied by roller, brush, spray or dip, the film self-vulcanizes to form a rubbery barrier against

A Specialist has only one love!

CLOSET "Spacesaver" showing Hi-Boy Furnace with "V" cooling coil on top and condensing unit outside house.

BASEMENT "Spacesaver" with Airtemp Lo-Boy Furnace.

AIRTEMP specialization in air conditioning makes it easier for you to sell and install AIRTEMP matched winter heating and summer cooling

Air conditioning in its full meaning—summer *plus* winter climate control—has been Airtemp's business for 20 years. This specialization of research, engineering, manufacturing and selling know-how can help you earn more money in two ways:

1. Features that no one else can match—benefits that mean more to your customers because they *do more* for them—make your selling job easier with Airtemp.
2. Winter heating and summer air conditioning units are "made for each other" in every detail by Airtemp. And these precision-matched units not only assure perfectly balanced year 'round air conditioning—they make installation easier and faster, save you precious man-hours on every job.

Make the Airtemp franchise the one that builds greater profits for you. Write for complete details to Airtemp Division, Chrysler Corporation, Dayton 1, Ohio.

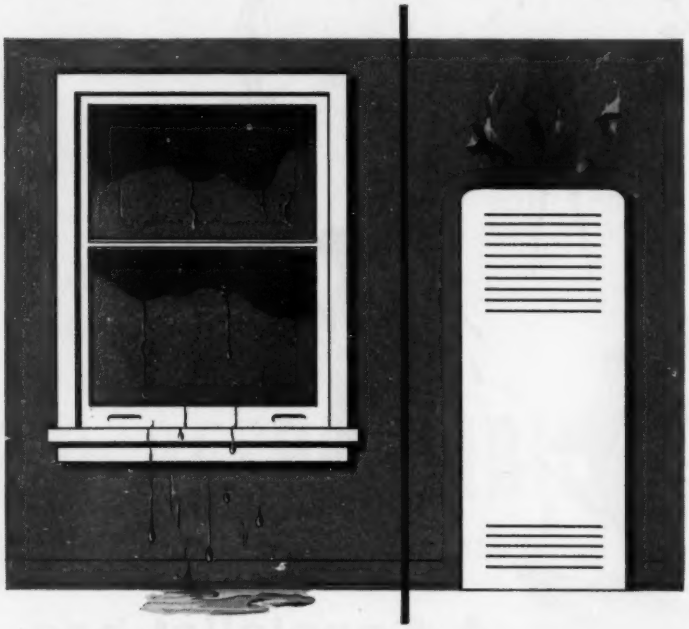
"The Line That Pays"

Airtemp

DIVISION OF CHRYSLER

HEATING • AIR CONDITIONING FOR HOMES, BUSINESS AND INDUSTRY

THE VENT THAT FAILED



This Could Happen To Your Customers

. . . if you're installing incorrect venting for their gas-burning appliances. And blistered walls . . . unhealthy, stale-smelling room air . . . condensation damage to walls and furnishings are just a few of the things that can happen when inadequate single-wall pipe, uninsulated vent connectors or other improper venting procedures are used.

The result can be equally damaging to your reputation as a dealer or contractor.

• *Why take chances — install* METALBESTOS *throughout*

This modern double-wall insulated vent features an **inner pipe** that keeps vent gases hot, assuring a strong draft for their quick, complete removal . . . an **outer pipe** that stays cool, preventing dangerous overheating of adjacent construction. And no mastic, tape nor heavy bracing is needed to install sturdy, lightweight Metalbestos — your insurance against customer complaints and time-consuming service calls.

For The Complete Story on Correct Gas Venting

. . . get your **free** copy of the VENT INSTALLATION HANDBOOK by writing Metalbestos today.

It Costs Less To Be Sure With The Best

Listed by Underwriters' Laboratories, Inc. as a Type B vent for use with approved gas appliances.

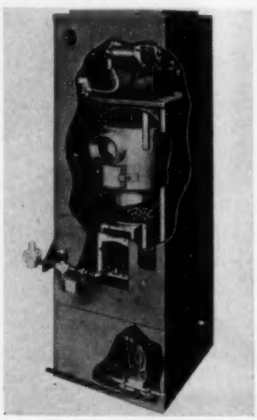
METALBESTOS DIVISION
WILLIAM WALLACE COMPANY · BELMONT, CALIF.

Stocked by principal jobbers in major cities. Factory warehouses in Atlanta, Dallas, Philadelphia, Des Moines, Chicago, New Orleans.

abrasion, expansion, contraction, etc., the company reports. Coating is said to resist continuous air temperatures up to 250 F; it is available in several colors for various applications.

Cooling Coil

DIRECT EXPANSION cooling coil for the company's counterflow furnaces — Airtemp Division, Chrysler Corp., 1600 Webster St., Dayton 1, O. Installed below the furnace, the unit is said to provide summer cooling



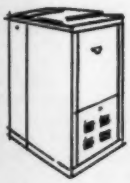
for the entire house with air distributed through regular heating ducts. Matching case of same width and depth as the furnace carries the coil. Coils are mounted in parallel in a vertical position in three rows of 12 tubes, 13 aluminum fins per in. Suction and liquid lines connect from sides or rear; condensate drain discharges to right or left. Coil may be used with "Airtemp" air cooled or water cooled condensing unit.

Gas Fired Furnaces

MODEL CFD-85 counterflow furnace with return air inlet at the top and warm air outlet at the bottom — John Zink Co., 4401 S. Peoria St., Tulsa 1, Okla. Adaptable for perimeter heating, units are equipped with automatic controls. Standard equipment includes shutoff, pressure regulator (except on LP gas), firing valve, automatic gas valve, thermostat and fan limit controls. Controls, burner, blower and other components are accessible from the front of the unit.

Why Armstrong dealers make money

Armstrong dealers have no inventory problems — no necessity for heavy inventory investment — no waiting for long-distance shipment when they need a furnace or a summer air conditioner in a hurry. Their nearby Armstrong wholesalers carry a heavy inventory for them and deliver in a hurry. That means money for operation, not money boxed up in your warehouse.



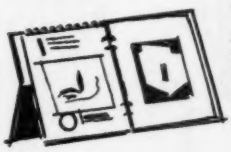
Installation time cost is at a minimum, because small units are shipped assembled, and others are designed to be easily assembled on the job. These two advantages alone, no inventory problem and minimum installation time, mean an Armstrong dealer is ideally set-up for either new house or replacement furnace work.

Precision of design and construction insures units which will require few if any of those costly call-backs which drain the profit barrel.

You never have to struggle to sell a unit which isn't ideal for the heating or cooling need; among Armstrong's 56 basic models and sizes of furnaces, and 12 of summer air conditioners, is one (or a pair) to do the job *right.*

56+12

And every one of them includes features, many exclusive, which help you sell at a profit against the professional price-cutter. The most successful merchandising aid ever produced by the industry, Armstrong's Visualizer, helps you pound home those features.



More sales power: The Armstrong line of furnaces and summer air conditioners is the only one which has been awarded the Parents' Magazine Seal of Commendation and is also accepted for advertising in Today's Health, published by the American Medical Association.

To make sure that you can cash in on all those advantages, Armstrong has this year put together another powerful national advertising campaign, and backed it with by far the most complete program of dealer promotion in the history of the company. Yes, the keystone of the Armstrong '55 program is dealer profit — *net* profit.

And we can prove it. It deals with *your* problems. It's organized. It's not a hit-or-miss proposition. It's as easy to understand as ABC. It will show you why Armstrong is "the company with get-up-and-go."

If you want to know what can be done to help *you* make money, call your nearby Armstrong wholesaler *now.* He'll lay the Armstrong plan proudly in front of you.

ARMSTRONG FURNACE COMPANY

ACCEPTED for ADVERTISING today's health PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION

COMMENDED BY THE CONSUMER SERVICE DIVISION PARENTS' MAGAZINE AS ADVERTISED THEREIN

ARMSTRONG FURNACE COMPANY

COLUMBUS, OHIO — DES MOINES, IOWA

Switch to - -

LINCOLN

Gas-Fired and Oil-Fired Furnaces and Air Conditioners

COMPLETE LINE — size ranges from 75,000 to 180,000 B. T. U. output at bonnet.

COMPLETE PACKAGE UNITS — factory assembled and tested — ready to install.

10 YEAR WARRANTY — on both the combustion chamber and heat exchanger.

MAXIMUM HEAT TRANSFER — assured by high efficiency 12 gauge steel heat exchanger.

FULLY U/L APPROVED — and acceptable by both F.H.A. and V.A.

COMPETITIVELY PRICED — every unit priced to meet today's competitive market.

Exclusive distributor and dealer franchises are available in certain desirable areas. Inquiries are invited.

WRITE FOR FULL INFORMATION

LINCOLN FURNACE Co., Inc.

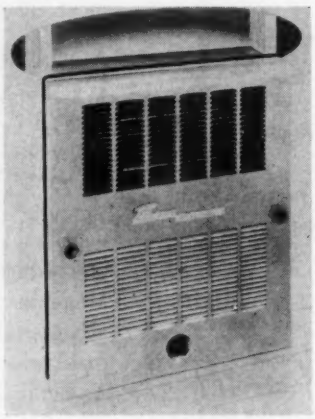
MANUFACTURERS OF GAS & OIL FURNACES AIR CONDITIONERS

230 Goffle Road • Hawthorne, N. J.

equipment developments

Convector Line

"BROWN-HEET" convector line with redesigned headers and cabinets — Brown Products Co., 97-12 Metropolitan Ave., Forest Hills, N.Y. Heating elements utilize bronze headers; front panels are held in place by formed lateral steel brace welded to inside front cover. Brace engages a



strut on the cabinet to hold cover panel in place. Baffle across the back of the cabinet adds structural strength and deflects additional heat through louvers, the manufacturer states. Units are available in free standing and recessed models in 6 and 8 in. depths.

Cooling Towers

SERIES FS cooling towers in 2, 3, 5, 7½ and 10 ton models featuring creosoted white pine wetted deck and propeller fans — Fulton Steelcraft Co., Swanton, O. Constructed of heavy gage copper bearing steel and bonderized inside and outside, units have stainless steel or glass fiber distribution pan, enclosed rubber mounted shaded pole motor, aluminum fan blades with galvanized hub or stainless steel blades and hub.

Direct Fired Heaters

STAINLESS STEEL direct fired heaters in capacities from 300,000 to 2,000,000 Btu, designed for use with gas

YOU are invited to read and use AMERICAN ARTISAN

You who are making your livelihood from warm air heating, residential air conditioning or sheet metal contracting can best use the practical helps published in American Artisan each month.

• Last year's record is evidence that the *Artisan* covers these subjects most thoroughly: 175 feature pages on Air Conditioning and Warm Air Heating; 170 pages on Sheet Metal Fabrication and Contracting; 215 pages on Management Methods. That's 560 pages—in addition to useful departments such as Questions & Answers, New Products, Trade Literature, Association Activities, etc.

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My Name .....
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Title .....

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City .....

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Business .....

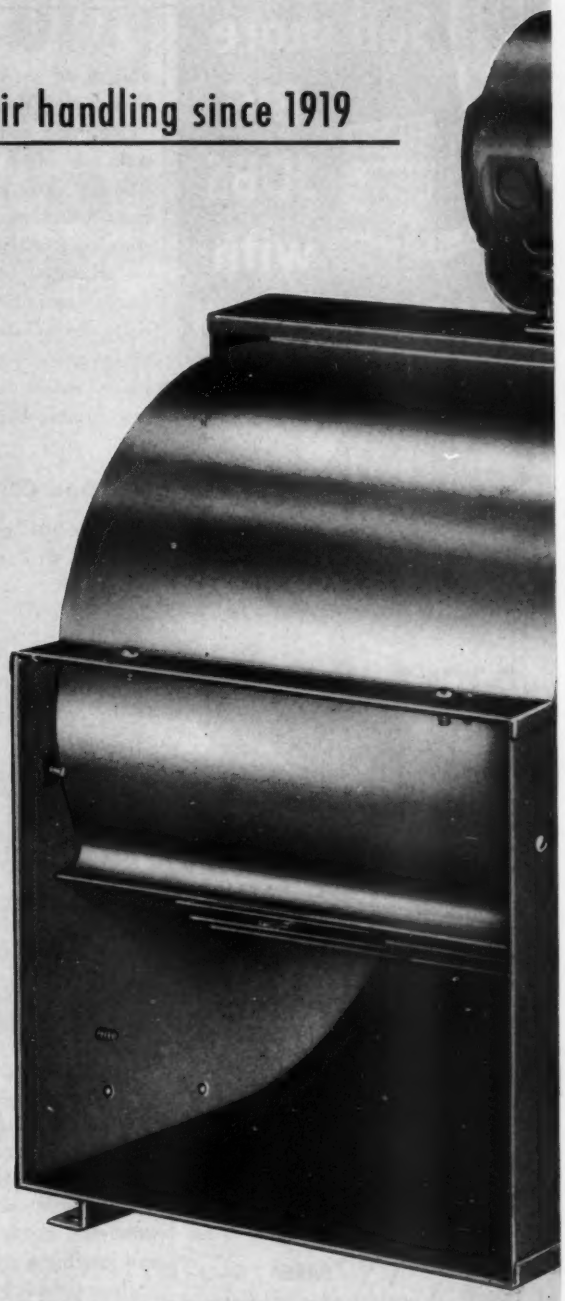
Brundage ...for better air handling since 1919

Quiet Please...

Quiet is the word for Brundage Blowers — and the key to happy customers who don't even want to know they have a blower.

Add the practically service-free performance of extra-strong construction and you have a sure hit with your dealers too.

Whether you manufacture heating or cooling equipment, you can be sure of the quality to match your finest product when you choose Brundage . . . quality proven since 1919.



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RELIABLE SERVICE — WHEN YOU NEED IT!

WRITE FOR FREE LITERATURE PRICES ON REQUEST

THE **Brundage** COMPANY

504 N. PARK STREET • KALAMAZOO, MICH.

Phone 2-0251

Sell more BIG JOBS with MT. HAWLEY!

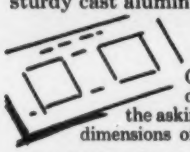
Mt. Hawley G-8 Oil Burner

You'll land more big-profit commercial jobs when you can talk about the owner-appeal values of the two biggest Mt. Hawley Oil Burners... and at a price up to 20% lower than competitive models of similar capacity. And you can handle any job from 5 gph. to 20 gph. with the Mt. Hawley G-6B or G-8.

SELL BY POINTING OUT:

rugged Marathon motor (½ h.p. on G-8)
big capacity Sundstrand pump

efficient, safe dual nozzle and ignition system
whisper-quiet operation through close-tolerance machining of all parts
sturdy cast aluminum housing



FREE! Get combustion chamber layouts for the asking. Send ratings and dimensions of boiler to be used.

MT. HAWLEY MFG. CO., PEORIA, ILLINOIS

MT. HAWLEY MFG. CO.
Dept. A-8, Routes 88 and 174, Peoria, Ill.
I want to know all about your G-6B and G-8 oil burners. Rush facts at no obligation.

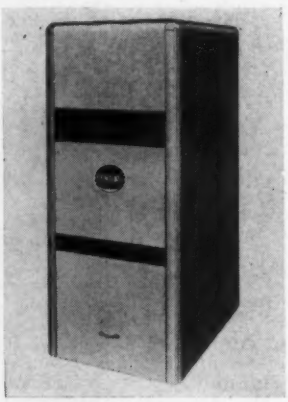
Name_____
Firm_____
Address_____
City_____ State_____

equipment developments

and/or oil — Arthur A. Olson & Co., Broad and Court Sts., Canfield, O. "Floating" combustion chamber is stainless steel; secondary heating transfer surface is comprised of 10 gage tubes and plate separated by stainless steel baffles. Heater operates on all fuels, according to the company; combination gas and oil fired units are available with interchangeable burners or single burner which burns either fuel. Automatic control circuit operates on 110 volts.

Gas and Oil Fired Furnaces

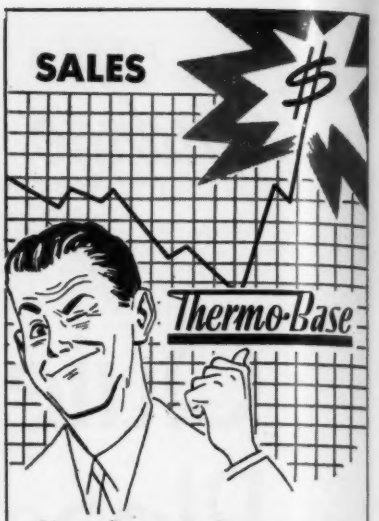
GAS AND OIL fired basement and utility room furnaces — Century Engineering Corp., 401 Third St. S.E.,



Cedar Rapids, Ia. Units are preassembled with gas or oil burner mounted, wired and enclosed in round cornered cabinets which are enameled inside and out. Channels and leveling screws on basement units replace special bases. Oil models have burner unit which burns all fuel oils; gas models have single port burners.

Forced Air Furnace

MODEL RFA-85 forced air furnace rated at 85,000 Btu — Royal Jet, Inc., 1024 Westminster Ave., Alhambra, Calif. Motor for both direct and belt driven blowers is 1/6 hp; blower on direct drive unit is 9 × 6 in., while belt-driven blower measures



I've found the secret - have you?

All over America dealers are changing to *Thermo-Base warm air baseboard distributors.*
You, too, will be glad you found the secret of Thermo-Base. And no wonder! Only *genuine* Thermo-Base takes the forced air "feel" *OUT* of the forced air system.
Thermo-Base provides dealers with special FREE Promotion Aids. This hard-hitting program has been designed to make *more* Thermo-Base sales for YOU. Quote Thermo-Base on every job and you'll find the secret of extra baseboard sales *and* profits!

Write TODAY for this new FREE SALES CATALOG

We'd like to show you more important reasons why there is no economical substitute for genuine Thermo-Base. Send today for this new FREE Catalog that contains a revolutionary new method for figuring installations. It is extremely simplified and completely safe for figuring heating in residential jobs.

GERWIN INDUSTRIES, Inc.
Dept. 11
Michigan City, Indiana

Here's The World's Only Humidifier with a Guaranteed Leak-Proof Glass Pan

New Viking 5600 AquaMagic

For A Limited Time Only
Your Distributor Is Offering
A Money-Saving Introductory Deal.
See Him Today!

1. LIFETIME GLASS PAN
. . . high quality ovenware glass can't corrode, rust, pit or leak. Eliminates call-backs caused by leaky pans.

2. THIRS-TEE EVAPORATOR PLATES
. . . newly developed composition that resists "caking" and insures maximum capillary action longer than other plates on the market.

3. VISIBLE ACTION VALVE
. . . hard-chromed brass valve with enlarged non-clogging orifice is positively opened and closed by water level in balanced pan. Owner can see the neoprene valve as it opens and closes.

4. DUAL CAPACITY ADJUSTMENT
. . . holds up to 10 evaporator plates although 5 fill most needs. Water flow can be controlled by adjustment of thrust rod behind name plate.

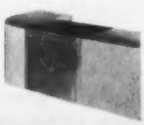
5. EASY-TO-INSTALL
. . . designed to fit smallest plenums without restricting the air flow. Simply cut round hole and attach with strainer-equipped shut-off valve to water line.

Viking®

AIR CONDITIONING
Division of The National — U. S. Radiator Corporation
5601 WALWORTH AVENUE • CLEVELAND 2, OHIO

BLOWER ASSEMBLIES
Belt Drive and Direct Drive Blowers with either permanent or Universal feet.

BLOWER PACKAGES
Round and square cabinet blower packages. Five capacities for from 75,000 to 230,000 BTU furnaces



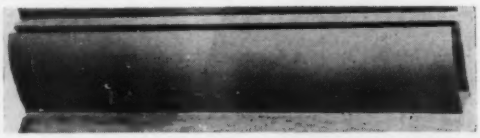
DUCT BLOWERS
Two sizes and six capacities from 600 to 3400 CFM. Mount in any position to boost air movement through ducts.

equipment developments *(Continued)*

10⅝ × 6 in. Unit measures 58¼ in. high, 14 3/16 in. wide, 25 3/16 in. deep. Closet clearance is 6 in. at front, top and vent.

Wall-to-Wall Baseboard System

"AIRE-LINE" baseboard perimeter air distribution system for heating, cooling and ventilation — Del. Wellcome Engineering Co., 7444 W. Carmen Ave., Chicago 31. Wall-to-wall design is said to provide draft free distribution. Made of 20 gage prime painted cold rolled steel, the base is available in 8, 10 and 12 ft lengths or in special designs and sizes in quantity orders; it is available in four sizes from 2½ × 1¾ in. to 8½ × 2½ in.

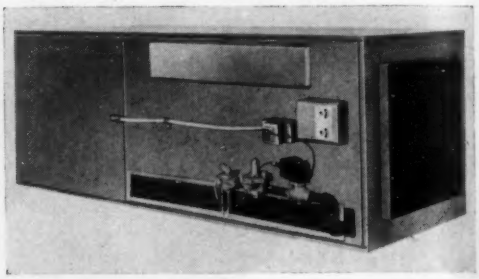


Forced Air Furnace

"COMFORTAIRE" forced air furnaces in 70,000, 105,000, 140,000, and 175,000 Btu input — Hammel Radiator Engineering Co., 3348 Motor Ave., Los Angeles 34. Choice of controls is offered, either in self-energizing or 24 volt systems. Smaller models can be installed in closet or alcove. Draft diverter is built into the heating element and is said to automatically increase the heating surfaces of the element.

Horizontal Gas Furnace

MODELS AF-80 and AFS-110 forced air horizontal gas furnaces with 80,000 and 110,000 Btu input respectively — John Zink Co., 4401 S. Peoria St., Tulsa 1, Okla. Units are designed for attic, closet, under floor or ceiling suspension installation. Heat exchanger is one piece welded construction; blowers and motors are mounted for quiet operation. Side flue outlet requires no additional height for diverter installation.



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Coil Stock!

WITH *Dahlstrom* FLYING CUT-OFF PRESSES

- For rapid and accurate cut-off of roll formed metal shapes.
- Enables use of coil stock in place of cut lengths.

Operating speeds of 240 or 300 R.P.M. 4 to 120 ton capacity.
Flag trip or positive mechanical run-out table to suit your needs. Simplified adjustment of height and lateral requirement.
Mechanical clutch on 4 ton units. Air clutch and air brake on 8 to 120 ton units.
Furnished complete with necessary upper and lower die slide and bolster plate.
All welded, heavy-duty construction.

Send us your problem. Give tonnage, stroke, maximum width of section, cutting length, pass line dimensions and tolerances required.

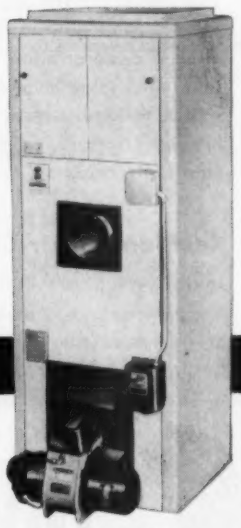
Dahlstrom MACHINE WORKS INCORPORATED

Roll forming machines, flying cut-off presses, coil reels, coil lifts, roll straighteners, decoiling roll feed lines, decoiling and shearing lines.
4233 West Belmont Ave., Chicago 41, Ill., Phone: SPring 7-3670

EVERYBODY'S TALKING ABOUT

ECONOMY*

New assembled Counterflo heaters



MODELS **GR-90E** (GAS)
OR-85E (OIL)
and **OR-96E** (OIL)

*International Economy®

Performance — the kind that pulls more paying customers — calls for star performers. You've got 'em to spare with International Economy! With the big, complete line of Economy furnaces (gas, oil or coal) you're sure to get every customer that's coming to you. It's the line that provides a solid, sales-clinching Ten Year Warranty. The line with quality built in, not bolted on. The line that gives your customers all-weather comfort and dependability at lowest operating cost. The line with every unit designed to install easier, last longer — with a minimum of trouble for your customers . . . fewer call-backs for you.

If all this sounds like money to your ears — and you'd like to hear more . . .

See your distributor—or write: Dept. A-855
International Heater Co., Utica 2, New York

COMPARE these International ECONOMY Counterflo features

- 10-Year Warranty
- Completely Assembled and Wired at the Factory
- Only 62½" high
- Gas Input 85,000 Btu.—Oil Output 84,000 and 96,000 Btu.
- Split Panel Access Doors for easier servicing of filters and blower
- Gas unit meets S.U.R.
- Handsome Heavy-Gauge Cabinet
- Convertible—Gas to Oil, Oil to Gas

The Finest in Home Heating since 1842...

INTERNATIONAL
Heater Co., Utica 2, N.Y.

new literature . . .

Gas Furnace Merchandising

MERCHANDISING PACKAGE for warm air heating dealers features a 32 page "sketchbook" which was designed to show builders and architects the advantages of heating homes with horizontal forced air gas furnaces and to serve as a guide for planning homes where such units will be installed — Norman Products Co., 1150 Chesapeake Ave., Columbus, O. The booklet is illustrated with sketches of actual homes and floor plan drawings that show the furnaces installed in attics or crawl spaces, or suspended from basement or utility room ceilings. Also included in the promotion package are copies of literature that can be used by the dealer after a demonstration of the sketchbook. An instruction folder gives helpful suggestions on how to go about setting up demonstrations of the sketchbook with home heating prospects. Sample direct mail letters and business reply cards are included for this purpose.

Residential Air Conditioners

INSTALLATION GUIDE for Model B 200-A residential air conditioners is made up of photographs and diagrams taken from a sound slide film — O. A. Sutton Corp., 1812 W. Second St., Wichita 2, Kans. Brief descriptive text accompanies each illustration to provide detailed information on installation procedures. Also included is a list of tools needed on the job.

Air Conditioning Control Centers

CONTROL CENTERS for year 'round air conditioning units are covered in a 12 page bulletin (No. 3054) — Penn Controls, Inc., Goshen, Ind. Included are typical wiring hook-ups for single stage and two stage systems.

Oil Burners

CIRCULAR describes various models of Shell head oil burners — Auburn Burner Co., Auburn, Ind. Features claimed include low initial and operating costs, quiet operation and simplicity of construction designed to keep service to a minimum. Illustrations include photos of complete units as well as a cutaway view of the Shell combustion turbulator used on "S" models.

Cooling Small Commercial Buildings

ANALYSIS FORM tells how soon a commercial air conditioning installation can pay for itself through increased sales and employee efficiency — Servel, Inc., 119 Morton Ave., Evansville 20, Ind. By means of

CONDUCTOR ELBOWS AND SHOES

- ALL SIZES
- ALL ANGLES
- ALL GAUGES
- ALL METALS

"Tapered to Fit"
"Galvanized after Formed"

THE CINCINNATI ELBOW CO.

4730 Madison Rd. Cincinnati 27, Ohio

SEE YOUR JOBBER

NEW FORCED AIR PANELRAY

FITS ANY BUDGET—ANY PLAN

When low-cost heating is a must – it's no longer necessary to settle for the "cold-floor" compromise of a simple gravity circulating type heater. The wonderful new Day & Night FA Panelray brings forced-air heat within easy reach of the average small home – old or new. Heat is delivered at the floor level from any of four sides in a foot warming blanket that gently rises to spread *even* comfort throughout the room.

LUXURIOUS FORCED-AIR COMFORT AT LOW COST

The slim silhouette of this compact unit actually takes no space at all – no special closet or compartment. It hides away in the wall. There are no major construction worries, no long and expensive duct lines, and of course it is ideal for popular slab and crawl-space construction. Installation is fast, easy, neat – and economical! Send for complete details on another famous Panelray – Day & Night's new FA – 65,000 BTU (slightly less for LPG); width 14", height 95½", depth 9½".

Every day more dealers say – it pays to sell the best

Panelray
A PRODUCT OF DAY & NIGHT
MONROVIA, CALIFORNIA

DAY & NIGHT
MANUFACTURERS OF AMERICA'S FINEST WATER HEATERS
HOME HEATING—AND AIR CONDITIONING EQUIPMENT!

the form and two tables, prospects can be given figures on the approximate extra profit from increased sales they can realize from air conditioning their places of business. One table shows average gross margins for small retail stores, drug stores, groceries, meat markets, restaurants and other such businesses. The second table shows the average number of working days requiring summer cooling in representative U.S. cities.

Air Conditioning Valves, Fittings

CATALOG R-5 (24 pages) gives size and application data for brass valves, accessories and fittings for air conditioning and refrigeration applications — Superior Valve & Fittings Co., 1509 W. Liberty Ave., Pittsburgh 26. Included is recent technical data on relief valves, check valves and low micron testing of standard line and globe valves.

Aluminum Sheet

WALL CHART gives weight and bend data on aluminum sheet in standard alloys — Kaiser Aluminum & Chemical Sales, Inc., Industrial Service Div., 1924 Broadway, Oakland 12, Calif. The chart is divided into three tables which provide data on weight per sq ft, weight per sheet in standard sizes and approximate radii for 90 deg cold bends of aluminum sheet in various gages, alloys and tempers.

Wet Dust Control

FOUR PAGE BULLETIN (No. 919) describes type "CW-1" centrifugal wet dust collector for the control of hot or moist, explosive or combustible, corrosive or abrasive dusts — Pangborn Corp., 560 Pangborn Blvd., Hagerstown, Md. Five photographs, three line drawings and two tables are included. The action of the vanes in dispersing the liquid to obtain greater capacity in reduced space is also illustrated and described.

Residential Humidification

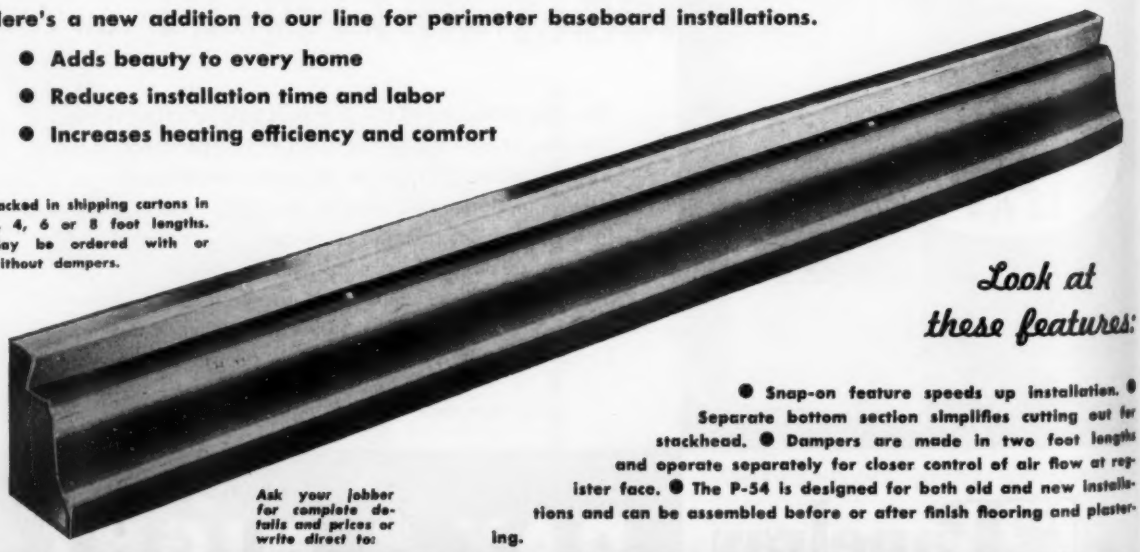
BROCHURE explains the profit possibilities of the humidifier market and provides tips to help dealers sell more humidifiers — The Humidifier Association, 2300 Payne Ave., Cleveland 14. Also being offered by the association are ad mats for use in local newspaper advertising explaining to the consumer how he can protect his health and property and increase his comfort through proper humidity. Another sales

For greater heating efficiency and savings specify this **NO. P-54 BASEBOARD DIFFUSER**

Here's a new addition to our line for perimeter baseboard installations.

- **Adds beauty to every home**
- **Reduces installation time and labor**
- **Increases heating efficiency and comfort**

Packed in shipping cartons in 2, 4, 6 or 8 foot lengths. May be ordered with or without dampers.



Look at these features:

● Snap-on feature speeds up installation. ● Separate bottom section simplifies cutting out for stackhead. ● Dampers are made in two foot lengths and operate separately for closer control of air flow at register face. ● The P-54 is designed for both old and new installations and can be assembled before or after finish flooring and plastering.

Ask your jobber for complete details and prices or write direct to:

THE A & A REGISTER COMPANY
8327 CLINTON RD. CLEVELAND 9, OHIO

"I shot an arrow into the air,
It fell to earth, I know not where."

The Arrow and the Song—Longfellow, 1845

Longfellow a space buyer?

Longfellow's lament could well have been applied to advertising back in 1845. Yes, even up to 1914 when a group of advertisers, agencies and publishers, alarmed by the waste and guesswork in their business, brought order out of advertising chaos by organizing the Audit Bureau of Circulations. These pioneers in circulation auditing established a definition for paid circulation, rules and standards for measuring circulation, methods for auditing and reporting the FACTS.

For value-minded advertisers the era of blind space buying ended in 1914. ☆ ☆ Today's experienced space buyers use the audited information in A.B.C. reports to aid them in applying media to markets and get full value for advertising dollars. Here are some of the FACTS in A.B.C. reports that provide a sound basis for advertising investments: • How much paid circulation • How much unpaid distribution • Occupational or business breakdown of subscribers • Where they are located • How much subscribers pay • Whether or not premiums are used • How many subscribers in arrears • What percentage of subscribers renew. ☆ ☆ Sales messages go direct to their targets, there's no shooting "into the air" when space buyers base their decisions on A.B.C. FACTS. This publication is a member of the Audit Bureau of Circulations because we want our advertisers to know what they get for their money when they use space in these pages. Ask for a copy of our A.B.C. report and then study it.

SEND THE RIGHT MESSAGE TO THE RIGHT PEOPLE

Paid subscriptions and renewals, as defined by A.B.C. standards, indicate an audience that has responded to a publication's editorial appeal. With the interests of readers thus identified, it becomes possible to reach specialized groups effectively with specialized advertising appeals.

A.B.C. REPORTS—FACTS AS A BASIC MEASURE OF ADVERTISING VALUE

help the association has made available is a bulletin containing detailed instructions on how to conduct direct mail campaigns.

Venting Gas Equipment

ILLUSTRATED, 28 PAGE BOOKLET entitled *Transite Gas Vent Pipe* presents information on asbestos-cement pipe for venting domestic gas equipment — Johns-Manville, 22 E. 40th St., New York 16. Data given covers both the round and oval shapes of Type B for general use and Type B-W for venting recessed wall heaters. Information on diameters, lengths, weights, etc. is presented in tabular form for quick reference. Installation recommendations are shown by close-up photographs and drawings. Methods of cementing and recommendations for cutting and machining are also illustrated.

Residential Heating Controls

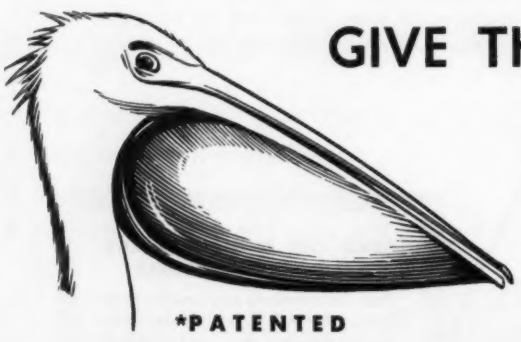
ILLUSTRATED BUYERS GUIDE, GEC-1030 (16 pages) shows models, applications, and typical installations of domestic heating controls — General Electric Co., Schenectady 5, N. Y. Photos, prices, ratings, dimensions and ordering information on all standard heating control units are included. The booklet illustrates product features and describes service facilities, the G-E exchange plan, and promotional aids available to heating control dealers.

Filtering Costs in Central Systems

A STUDY OF FILTERING COSTS in central systems compares the costs of cleanable and replaceable types of air filters — Owens-Corning Fiberglas Corp., 1930 Nicholas Bldg., Toledo 1. The study points out that there is a growing tendency to use multiple layers of 1 in. thick filters instead of 2 in. and to replace only the first filter in the multiple layer series when the amount of dirt trapped is sufficient to build up an overly high resistance to the air flow through the filter bank. This rotation system, according to the company, lowers maintenance costs.

Stainless and Other Steels

POCKET SIZE FOLDER describes literature available on the selection, fabrication and application of stainless steel and other high alloy specialties — Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22. Eighty-five of the company's current technical data sheets and booklets are listed.



GIVE THE OTHERS THE BIRD!

Choose BRANDES*

*PATENTED

Your best buy in

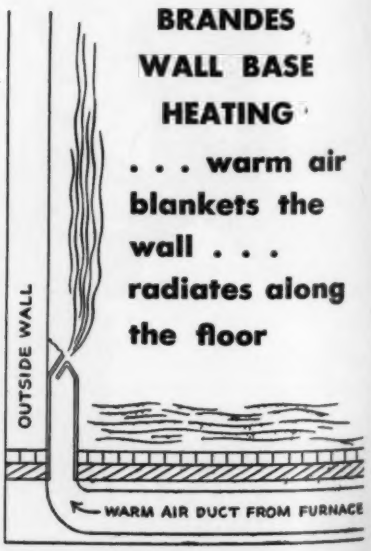
WALL BASE HEATING

No matter what your income bracket, Brandes can meet your demands. Three distinct lines and a total of fourteen different sizes to choose from makes Brandes Wall Base Heating the most complete line on the market today. With Brandes Wall Base Heating you get the maximum in beauty and performance . . . at reasonable prices, too!

THE BRANDES COMPANY

2046 Winnebago Street, Madison 4, Wisconsin

Write for Catalog



Merchandising Heating Units

CIRCULAR describes a 21 page easel mounted sales presentation for "Victor" furnaces — Hall-Neal Furnace Co., 1322-32 N. Capitol Ave., Indianapolis 7. Compact in size — 8½ by 11 in. — the book is illustrated throughout and features a spiral type binder to facilitate turning pages during the course of a sales talk.

Gas and Oil Warm Air Heaters

CATALOG GC-4-55 on gas and oil fired warm air heaters features a full color cutaway illustration of a direct fired heater which is keyed to identify component parts — Thermobloc Div., Prat-Daniel Corp., 2 Meadow St., South Norwalk, Conn. Photographs and dimensional drawings of floor set and suspended models are included, also photos of typical installations in various industries.

Through-Wall Flashing

BOOKLET explains how to use "Anaconda" through-wall flashing — The American Brass Co., Building Products Service, Waterbury 20, Conn. The flashing is designed to provide tight joints, and corner pieces are of one-piece construction. Zig-zag corrugations are designed to make possible a complete bond in the mortar. Ask for publication C-28.

Furnace Cleaning Equipment

FURNACE AND AIR CONDITIONER cleaning equipment is described in a three-fold, two-color envelope stuffer — Premier Co., 755 Woodlawn Ave., St. Paul 1. Featured is a description of the "Spic-Span" machine developed by the company for low-cost furnace cleaning. Cleaning tools for the "Spic-Span" and "P-098F" heavy duty unit are listed.

Zinc Coatings

ILLUSTRATED BOOKLET, *How Zinc Controls Corrosion*, explains how zinc can lengthen the life of steel products and reduce maintenance costs — American Zinc Institute, 60 E. 42nd St., New York 17. Drawings, charts, and photographs together with brief comments present the corrosion control characteristics of zinc coatings, zinc pigments and zinc anodes.

Air Conditioning Units

CENTRAL STATION air conditioning units ranging in capacity from 600 to 48,000 cfm are described in Bulletin 8127 (20 pages) — American Blower Corp., Detroit 32. Ten pages of the catalog are devoted to

ROCHESTER
UNIVERSAL
OIL TANK GAUGES

Guarantee

No Oil Fumes or Spills

LEAKPROOF, MAGNETIC—no shaft hole in gauge head. Non-electric, permanent magnet transmits float arm movement into dial movement.

LOW COST—complete installation—no additional servicing. No seepage or smelly oil fumes means more profits for you.

EASY TO INSTALL—merely screw in adapter, bolt on gauge. No adjustments necessary regardless of oil level.

LARGE DUAL DIAL—just turn gauge to mount at either end or center of tank.

NO DISCOLORATION—no fumes or seepage reach gauge head to discolor dial or crystal. Easy to read, permanently clear for years.

ACCURATE—sensitive pivot bearing coordinates response of rotating dial to any movement of float arm.

GUARANTEED—in material and workmanship, and in customer satisfaction.

UNDERWRITER APPROVED—safety factor far exceeds the requirements of the Underwriters. The model 3175 Gauge withstands tank pressure of 200 pounds per square inch.

OIH

Stocked by Leading Wholesalers Everywhere—or write to Rochester Manufacturing Company, Inc., 8 Rockwood Street, Rochester 10, N. Y., U. S. A.

ROCHESTER
MANUFACTURING COMPANY, INC.
DIAL THERMOMETERS GAUGES AMMETERS
ROCHESTER GAUGES

8 ROCKWOOD STREET ROCHESTER 10, N.Y., U.S.A.

Every help you need for Volume Sales

National Advertising • Newspaper Mats • Many Colorful Folders • Floor, Wall and Window Displays
BOOSTING
the Majestic way
to dispose of . . . .
GARBAGE
BURNABLE TRASH
NEWSPAPERS AND MAGAZINES

What a sales story there is to tell about this Majestic Incinerator! And it's told over and over again in the many sales helps Majestic can furnish, all prepared and ready to go to work for you. National advertising is building up a big demand for this *complete home disposal system*—make sure now that you have an ample supply of units and the full Majestic story.

Today's Most EXCITING Modern Home Appliance!

Majestic's Model 10-G Incinerator—designed by a company making incinerators for 25 years—is a big 2-bushel unit, with a gleaming, modern cabinet housing a hooded, dehydrating pilot as well as a full-flame burner—both trash and garbage disappear *like magic!*

MILLIONS of potential prospects will see the full story of Majestic's magic disposal in these and other national publications. Ask your distributor for details.

The *Majestic* Company, Inc.

110-A Erie Street
Huntington, Indiana

new literature (*Continued*)

tables and graphs designed to enable heating and ventilating engineers and contractors to determine the type of unit that will meet individual job requirements. Selection data covers sprayed coil units, multi-zone conditioners and air conditioning units for cooling and dehumidifying in summer and heating in winter.

Small Lot Stamping Service

A SMALL LOT METAL STAMPING service is described in an illustrated bulletin (F-230) — Dayton Rogers Mfg. Co., 2824 - 13th Ave., S., Minneapolis 7. Featured are typical examples of short run stampings from ferrous and non-ferrous metals using a temporary tooling process.

Porcelain Enameled Panels

ARCHITECTURAL DETAILS on the use of porcelain enamel in the Ford central staff office building at Dearborn, Mich. are presented in data file No. 200 — Ingram-Richardson Mfg. Co., Beaver Falls, Pa. Included are architectural drawings of the porcelain enameled panels, wall sections and mounting details; installation photographs; design data on the panels; and specifications for porcelain enameled steel.

Steel Bars, Plates and Sheets

BULLETIN 11-2 gives information on basic steel products including bars, structurals, plates, sheets and strip — Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80. Standard specifications, descriptions of cutting and shearing methods, and ordering information are included. Hot rolled carbon bar, structural, and flat rolled steels are featured.

Packaged Air Conditioning Units

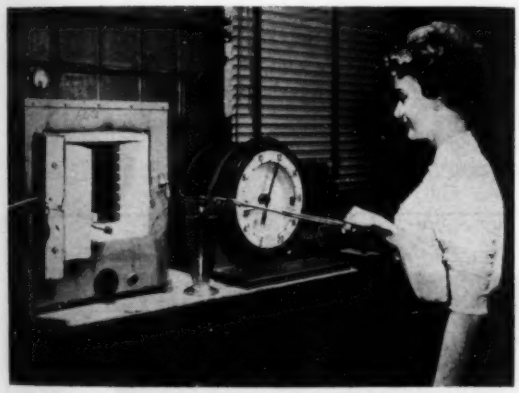
ILLUSTRATED BULLETIN (No. C-1100-B64) covers packaged air conditioning units for small commercial applications such as savings and loan associations, restaurants, candy stores, etc. — Worthington Corp., Harrison, N. J. The units are designed to blend in with any decorative scheme, and as multi-packaged installations can be used to cool multi-story buildings.

Welding Equipment

CATALOG 2350 (16 pages) covers "Aircomatic" equipment for use in inert gas shielded metal arc welding —Air Reduction Sales Co., 60 E. 42nd St., New York 17. Data is given on water and air cooled guns, water cooled heads, shielding gases and control equipment. Also covered are welders, contactors, filler wire feeders and clutch kits.

we hear that . . .

A NEW SALES TRAINING and sales promotion program for dealers has been developed by Thatcher Furnace Co. The sales training program consists of four parts: telephone canvassing; door-to-door canvassing; conducting a home survey; and making the return call. Each subject is covered in a separate handbook which takes the dealer, step-by-step, through the particular situation. Sales points, sample conversations, answers to prospect objections and many other specific methods are dramatized for each topic. Promotional items include spring and fall newspaper mats, spring and fall double post card mailers, door knob hangers, throwaways in color and envelope stuffers. As the focal point of the entire program, the company has produced a 45 page full color visual retail sales presentation designed to help the dealer explain to his prospect the importance of buying a good heating system made by a reputable manufacturer and installed by a qualified dealer.



TECHNICIAN subjects a heat exchanger sample to the "cold water quench test" in the laboratories of Janitrol Heating & Air Conditioning division, Surface Combustion Corp.

HEAT EXCHANGERS produced by the Janitrol Heating & Air Conditioning division, Surface Combustion Corp., are put through drastic tests to prove their durability. In the test shown above, samples of heat exchangers are heated to 1200 F in the electric furnace then removed and quenched in the beaker of cold water. This cycle is repeated many times, and the company reports that the samples show no evidence of damaging deterioration.

CARRIER CORP. has formed a new central planning division which will include the present planning staff and will be headed by John H. Holton, a vice president of the corporation. The new division will coordinate all divisional and major departmental plans and will also engage in long term planning for the corporation as a whole.

New sales aids the firm is offering its dealers and

AVERAGES 10% LESS
IN
OPERATING
COST
The same design features that make the standard Lo-BLAST famous for efficiency are now available in this residential size burner.

LO-BLAST
ECONOMITE
THE "MIGHTY MITE"
OF CONVERSION GAS BURNERS

Nothing like it on the market! Here, indeed, is an *utterly different and better* gas burner. Consider these features: Power burner design assures perfect combustion, regardless of natural draft conditions—a proved fuel saver—safe and efficient for down-draft heating plants. The Economite burns so smoothly you can't tell when it's running—no "pop" when the burner goes on and off.

Every Economite is factory-tested on gas and shipped assembled—fully equipped with fool-proof safetys. Simplicity of design and durable construction reduce service to a minimum. Capacities of 70,000 to 500,000 BTU give thorough coverage of the residential field.

DEALERS! You can make real money on the exclusive sales features of the Lo-BLAST Power Gas Conversion Burner. Get the facts—write today.

The Standard Lo-BLAST for larger installations. Capacities up to 20,000,000 BTU input.

MID-CONTINENT
METAL PRODUCTS CO.
1960 N. Clybourn Ave., Chicago 14, Ill.

we hear that *(Continued)*

distributors are a 12 page "tabloid" and a pocket-sized "Weathermaker" handbook. The newspaper — a simulated daily titled *Carriertown Clarion* — reviews merchandising plans for its residential air conditioning line, describes sales presentation and sales promotion kits, and outlines special dealer training programs. The handbook, designed to make air conditioning estimating easier for dealers, also offers a guide to markets for self-contained equipment and provides a comparison chart on competitive product performance and operating costs.

The company reports that the "road show" conducted by its Day & Night division recently passed the 20,000 mile mark. Each meeting covers new products, national promotion, sales aids, installation and servicing techniques. Plans for the remainder of the year include additional meetings in all sections of the country and estimates of a total for the year exceed 40,000 miles.

▸ THE NATIONAL and the Southern Associations of Industrial Distributors recently held a special planning meeting at Atlantic City. One of the highlights of the meeting was the planning of an advertising campaign — to be in effect the week of August 15 — designed to increase awareness of the role of the industrial distributor in the merchandising of industrial supplies. Joint committee chairmen appointed at the meeting include John D. Williams, joint advertising and awards committee; Alex V. Davies, joint committee on catalogs; and F. Marsena Butts, joint educational aids committee.

▸ WYSONG AND MILES CO. will display six of its latest units at the forthcoming show of the National Machine Tool Builders Association to be held in Chicago. The company's exhibit will include five squaring shears and one all-steel bending roll.

▸ A "CONSUMER SATISFACTION" survey is being conducted by the Mitchell Mfg. Co. to keep tabs on the kind of job its air conditioners are doing in the field. Every purchaser is provided with a form on which he is invited to make comments as to the performance of his unit after it has been put in actual use. E. A. Tracey, general sales manager, says that the survey not only has value for the manufacturer, but is proving valuable at the dealer level in improving installation and servicing techniques.

The company recently sponsored a product design contest for dehumidifiers open to students of the

You need NO SPECIAL TOOLS...
to make them fit!
Dieckmann Elbows are made from one piece terne coated, iron and steel, hot dipped galvanized after formation. Also made of all other standard metals in a full range of sizes and angles.
• Ask for illustrated catalog #47 and other literature.
The Ferdinand Dieckmann Co.
1180 Harrison Avenue
Cincinnati 22, Ohio

we hear that (*Continued*)

School of the Art Institute of Chicago. Each student was required to design and build a model of a dehumidifier around specifications designated by the firm's engineering department.

THE AIR CONDITIONING division of American Radiator and Standard Sanitary Corp. has assigned special sales crews to explain details of its fall promotional campaign to dealers. Each crew is equipped with a panel truck showroom for carrying demonstration models of new winter air conditioners

▸ THE AIR CONDITIONING division of American Radiator and Standard Sanitary Corp. is conducting an extensive fall newspaper and billboard advertising campaign in the Cleveland and eastern Ohio area which will continue until the end of November. According to Henry Rossell, sales manager of the division, 76 billboards and over 33,000 lines of newspaper advertising will be used to publicize warm air heating and the names of local dealers cooperating in the campaign.

▸ THE MAJORITY of more than 1400 production employees of Copeland Refrigeration Corp. agreed to postpone or cancel vacation plans for this year in order to stay on the job and help the company meet production schedules. Stepped-up schedules were necessitated by a 70 percent increase in the demand for air conditioning and refrigeration compressors and condensing units.

▸ THE PACIFIC DIVISION of Lennox Furnace Co. has moved into its new Los Angeles headquarters located at 2041 S. Saybrook Ave.

▸ THE AIRTEMP DIVISION of Chrysler Corp. recently concluded its *Prizes In the Air* national sales contest. Automobiles, fully equipped and air conditioned, were presented to the four distributor wholesale salesmen who completed the most sales during the contest period. The winning salesmen are Alex MacLean of Wilson Supply Co., Washington, D. C.; William Elliott of S. S. Fretz, Jr., Inc., Philadelphia; Howard Kraft, of

Get back 20¢ on every STEEL dollar

Phone ROLLED STEEL PRODUCTS at ORchard 3-7400 Skokie, Illinois, and save up to 20% on all your steel needs!

Save up to 20% on all your steel needs . . . all sizes, all types, all gauges . . . by calling us collect at ORchard 3-7400 Skokie, Illinois. We *unconditionally guarantee* your satisfaction. Immediate delivery anywhere. Rush orders our specialty.

Call us today and let us quote you our low prices. There's no obligation. All you risk is a savings!

Another of the typical MONEY SAVING values from ROLLED STEEL PRODUCTS.

30 tons, 26 gauge — 24" x 60" and larger — galvanized sheets $6.95 net/cwt.

Other sizes and all gauges available at bargain prices.

Rolled Steel Products

Division of Emergency Steel Service Corporation

Distributors of SHEETS PLATES BARS STRUCTURALS STRIP

GENERAL OFFICES & WAREHOUSE

7415 St. Louis Ave. Skokie, Illinois

ORchard 3-7400

we hear that (*Continued*)

the Air Products division of Climate Control, Phoenix; and John Truett of Low-Temp Distributors, Inc., San Antonio. M. T. Bard, division sales manager, says that the contest was one of the most successful the division has ever sponsored.

▸ THE CARLIN CO. has completed a new building in Wethersfield, Conn. which provides approximately two and a half times the working and storage space of its former plant.

▸ THE COOLER DIVISION of Utility Appliance Corp. is using television spot commercials to promote dealer sales of air coolers. Two of the four commercials being used are devoted to the firm's new "CarryCool" portable unit.

▸ THE GALLAHER CO. plans to expand its production by opening a new plant in Council Bluffs, Iowa. All belt driven power roof exhausters will continue to be produced at Millard, Nebr., but direct drive units will be produced at the new plant.

▸ BUILDER JAMES D'AGOSTINO attributes more than 40 percent of his sales of houses in the Stonehurst Manor (Tenafly, N.J.) development to the year 'round air conditioning feature. There are more than a hundred homes in the project with air conditioning supplied by General Electric units.

▸ THE MISSION APPLIANCE CORP. recently held a "Summer Christmas Party" for its sales representatives. Invitations were sent on Christmas cards and products introduced at the meeting were all gift-wrapped to dramatize the "plus-values" of the products being offered. Among the new equipment presented were the "Doubleglas" water heater and a new air conditioning system powered by gas.

▸ DONALD L. ROSSITER has been appointed vice president and general manager of sales by Inland Steel Products Co. He was formerly assistant general manager of sales, engineering products. He has been with the company since 1938 and has served as manager of the branch plants, offices and warehouses at Canton and Cleveland, and as manager of the metal lath products division in Milwaukee.

▸ A NEW FOUR COLOR DISPLAY being distributed by White-Rodgers Electric Co. demonstrates how quietly the firm's "Cushioned Power" solenoid valves can operate. The display comes fully equipped except for

benefit 3 ways!
INSTALL
PATCO AIR BASEBOARD
For Cooling
For Heating

(1) You will lower YOUR installation costs, (2) get more jobs done and (3) make your customers more comfortable when you install PATCO AIR BASEBOARD. That's been the experience of contractors everywhere because:

1. you don't have to waste time handling and fitting bulky, rectangular duct work.
2. 4" or 5" round pipe (inexpensive industrial downspouting in 10' lengths) or standard duct work can be used with the PATCO connectors.
3. you simply nail the baseboard to the studs, snap on the diffuser face.
4. customers get pleasing appearance, greater economy, cleanliness, silent, draft-free operation.

Get complete details today and, remember, PATCO AIR BASEBOARD has all-around use in new or old homes, one story or two with or without basements.

PATCO
AIR BASEBOARD
THE WALL RADIATOR HEAT

PATCO MFG. CO.
231 N. 3rd St., Philadelphia 6, Pa.

★ ★ ★

Address Changing? Tell Us At ONCE!

A postal regulation relating to the handling of undelivered mail could result in some issues of *American Artisan* being thrown away instead of being returned to us — as they have been in the past — for remailing to your new or correct address.

To avoid missing any issue of *American Artisan* it is more important than ever to report both your new and old address to us and your post office. Deadline is the 18th of the preceding month for the next issue. Send changes — and new local postal delivery zone — to

AMERICAN ARTISAN
6 N. Michigan Ave.,
CHICAGO 2, ILL.

★ ★ ★

SAVE TIME and MONEY

when you form

FLEXIBLE CONNECTORS

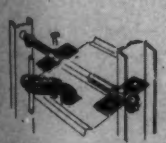
ELGEN SILENT DUCT

*Pats. Pend.

Imagine, this one-piece, factory-assembled metal-to-material unit unrolls absolutely *flat!* No more bothering with unwieldy duct material that buckles easily. Elgen Silent Duct makes on-the-spot work a cinch . . . you just measure and cut. You can fabricate *any type* of flexible duct connector in minutes . . . with half the effort! You can save up to 60%! No more worry about an inventory of "made-up" parts, either. Your choice of U.L. approved, (Gov't. Spec. Mil-D-10860) canvas, *Johns-Manville* asbestos and *U. S. Rubber* neoprene coated fibre glass, in 3" or 6" widths attached to 24 or 26 gauge galvanized steel or 24 gauge aluminum to fill every job requirement. All available in handy-to-use 25, 50 or 100 foot rolls.

2 More Elgen Products That Put Profits In Your Pocket!

ELGEN ALL-TITE VANE RUNNER
• Quickest and easiest way ever devised for installing turning vanes for square elbows • No special tools required; vanes lock easily with blow of hammer



ELGEN DAMPERSET
For Multi-Blade Dampers . . . Parallel or Opposed • Most perfect damper hardware developed • Assembles in a jiffy . . . cuts assembly time in half • Easily adjusted and self-aligning. Licensed by Minneapolis-Honeywell

ELGEN PRODUCTS ARE SOLD THROUGH LEADING JOBBERS EVERYWHERE.

"Put Profits In Your Pocket!"

Write today for free catalog and "spec" sheet! Dept. A-8

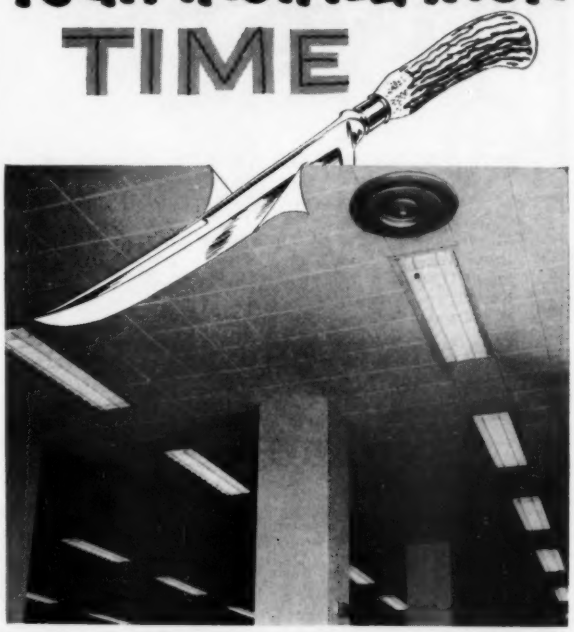
ELGEN MANUFACTURING CORP. 41-34 39 Street, Long Island City, N. Y.

CONNOR ENGINEERING CORPORATION

kno·draft®

adjustable air diffusers

HALVE YOUR INSTALLATION TIME



CONTRACTORS tell us they can install Kno-Draft *Adjustable* Air Diffusers in just about half the normal time. And *you can't go wrong!* Kno-Draft Diffusers are completely adjustable *after* installation. You'll do a better, quicker job with Kno-Draft—and get your job approvals faster.

Installation is simple as: (A) attach the outer cone of the Kno-Draft Diffuser to the duct, (B) fasten the pre-assembled diffuser unit to three suspension bolts, (C) adjust air direction to any discharge angle from horizontal to vertical with just a few screwdriver turns. Balancing and air volume adjustment are equally simple. Single annular air stream permits direct volumetric readings; damper is regulated by calibrated screw.

For full information, send for the Kno-Draft Data Book. Connor Engineering Corporation, Danbury, Connecticut.

-------MAIL COUPON TODAY-------

CONNOR ENGINEERING CORPORATION
Dept. M-85, Danbury, Connecticut

Please send copy of your 32-page Kno-Draft Data Book.

Name_____

Company_____

Street_____

City_____ **Zone**____ **State**_____

Here's the New "JET-8"
GAS CONVERSION BURNER

Make this your BANNER YEAR for profits, with Banner's new "Jet-8" Gas Conversion Burner.
1—Piece Cast Iron Burner Head
Telescoping Venturi.
Minneapolis-Honeywell Powerpile Controls.
Input — 80,000 to 200,000 B.T.U.
Silent Operation.
Competitively priced.
Write today for complete information and prices.

BANNER BURNER CO.
DEPT. A
227 E. INDIANOLA AVE., YOUNGSTOWN, O.

PRESS BRAKES

Series A Light Duty Model CHICAGO Press Brake

In the almost limitless variety of operations on sheet metal and steel plate, CHICAGO Press Brakes are well known for their consistent production performance. The proved all-steel construction and the flexibility of design in all models offer a versatility that is hard to beat. With 42 standard sizes, there is a CHICAGO steel press brake to suit your requirements.

Full Particulars and Recommendations for Any Job on Request

4934

DREIS & KRUMP MANUFACTURING COMPANY
7404 S. Loomis Blvd., Chicago 36, Ill.
CHICAGO

we hear that (Continued)

valves and transformer. It is available without charge to heating jobbers who are stocking the new "Cushioned Power" valves.

▸ OVER 100 GENERAL ELECTRIC franchised dealers and salesmen for home heating and cooling equipment won a trip to Trenton, N. J. in a sales contest sponsored by Raub Supply Co., Lancaster Pa. distributor. The winners toured the Home Heating and Cooling department's plant where gas and oil warm air furnaces and home cooling units are made.

Frank H. Faust, manager of marketing research for the company's Air Conditioning division by day, at night teaches a graduate course in industrial marketing research at Stevens Institute of Technology.

▸ COMBUSTIONEER DIVISION, The Steel Products Engineering Co., recently concluded a four day sales meeting attended by district managers from all parts of the country. H. W. Shirey, manager of the division, and other company officials presented sales plans and new products for the coming heating season.

▸ AMERICAN RADIATOR and Standard Sanitary Corp. has established an Atomic Energy division to coordinate all company activities in that field. Frank A. Parker has been appointed director of the new division and David J. Mallon director of research operations. Division headquarters will be in Redwood City, Calif. where the firm has one of its research laboratories.

▸ AHRENS & MCCARRON, INC., St Louis distributors, recently held a sales meeting on the Rheem Mfg. Co.'s new line of heating and air conditioning equipment. Over 200 contractor-dealers from Missouri and southern Illinois were in attendance. Speakers included A. F. Cassidy, J. L. Hoyer, and B. E. Soby of the Rheem company. Herbert Huth, St. Louis representative, acted as master of ceremonies.

▸ WORTHINGTON CORP.'s Midwest Regional Engineering and Service division has moved to new quarters at 6124 N. Pulaski Rd., Chicago. The new operation will be under the direction of L. R. Dise. The Chicago district sales office, headed by W. C. Cheek, will continue at 400 W. Madison St., Chicago.

▸ THE TYWEL MFG. CORP. has changed its name to the Lewyt Air-Conditioner Corp.

▸ FORMING THE ENTRANCE to the Kaiser Aluminum & Chemical Corp.'s exhibit in Walt Disney's new park at Anaheim, Calif. is a giant aluminum telescope more than 40 ft long and 8 ft in diameter. At the exhibit,

"I wouldn't use anything but

TI-CO®

in my shop,"

Says **Mr. Earl Rocky,** Supt. of **O. A. Wendt Co.,** Chicago

"We have been using close to 500 tons of Inland TI-CO per year for the past several years and I have yet to have a sheet flake on me. Even on the lockseamer, and we make our seams especially tight, TI-CO performs beautifully. Ask any of the boys in my shop and they'll tell you the same thing."

Mr. Rocky, like a great many other sheet metal contractors, has learned that there is a tremendous difference between TI-CO and just any conventional galvanized sheet. Inland TI-CO is made by a special continuous galvanizing process which eliminates the brittle iron-zinc layer that causes ordinary "pot-dipped" galvanized coatings to flake.

Ask your dealer for Inland TI-CO
Look for this stencil
on all your galvanized sheets

INLAND TI-CO®

Write Dick Killelea, Dept. 253-A

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul • Davenport
St. Louis • Kansas City • Indianapolis • Detroit • New York

The Modern Draft Control that's "QUIET AS BARE FEET"

There's no need to pussyfoot around the fact that a rattling, squeaky draft control adds up to a problem job. And there's nothing "hush-hush" about the fact that Windmaster's vane is *permanently silent* — riding smoothly on two bearings of DuPont molded nylon.

Quiet and free from friction, Windmaster's nylon bearings will outwear steel and never need oiling — in fact, condensation or moisture lubricates nylon, with no chance of rust or corrosion.

- ***Non-Rusting, Permanently Silent Nylon Bearings***
- **45° Vane — no nervousness — faster response.**
- **Sloping Pipe Installation on the side of the pipe**
- **Large Square Vane — more effective area**
- **Calibrated Counterweight**
- **E-Z 'Dapter—quick, easy installation.**

Consult Your WHOLESALER

Windmaster® Corporation

43 Vine St. **Columbus 15, Ohio**

BEVERLY *Pneumatic* THROATLESS SHEAR

CAPACITY
3/16 MILD STEEL
10 GA.
STAINLESS

FASTER,
EASIER CUTTING
to any Shape!

- Compactly built for maximum visibility and efficiency
- Operates on 35 to 150 PSI air pressure
- Adjustable power and return stroke length and speed

Beverly Pneumatic Shears combine all the advantages of Beverly Throatless Shears with fast, effortless cutting action through air cylinder operation. Air operation speeds work, permits accurate cutting to a pattern or template, as operator can concentrate on guiding work through the shear. Flow control valves permit precise adjustment of stroke speed; adjustable actuating arm controls stroke length. Foot Switch permits operator to use both hands on the work piece. Operates on 110V. 60 cycles AC and 35 to 150 PSI air pressure.

See your nearby Beverly Distributor
Write for catalog sheet and complete details.

BEVERLY SHEAR MANUFACTURING CO.
3020 W. 111th STREET • CHICAGO 43, ILLINOIS

FLANGES THE DUCT
with Amazing Speed!
Less than 5 seconds on short and lighter pieces . . .
Slightly longer on bulkier pieces

MAKES PERFECT
DRIVE-CLEATS TOO!

The ONLY tool that does both. A complete drive cleating tool . . . no set-up time . . . no adjustments. Handy to take out to the job when not needed in the shop. Turns idle time into production time. Flanges any square duct up to 20 gauge. Quickly pays for itself in time, material and labor savings.

No. 12 Smith's Cleat Bender (12" wide) . . $46.20*
No. 18 Smith's Cleat Bender (18" wide) . . $72.60*
*F.O.B. Waukegan, Illinois
Prices subject to change without notice

PERFECT DRIVE CLEATS fit the duct without the use of a screwdriver.
TREMENDOUS SAVINGS in erection time and labor.

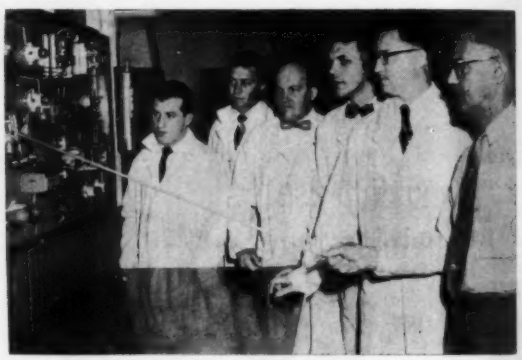
R. E. SMITH
1124 Elizabeth Avenue • Waukegan, Illinois

we hear that (Continued)

lecturers explain the many uses of aluminum, and visitors may participate in various demonstrations. In the "Tomorrowland" section of the park are an aluminum rocket ship 80 ft in height and a 24 ft tubular clock. Architectural uses of aluminum are in evidence throughout the park, many of the walls, both exterior and interior, being made of aluminum.

▸ WILLIAM L. MCGRATH, president of the Williamson Heater Co., was the U. S. employer delegate to the recent 38th conference of the International Labor Organization held in Geneva.

▸ WILLIAM S. RHEEM II, general manager of the Rheem Mfg. Co., has been elected to the corporation's board of directors and named a vice president of the company.



THE HIGH AND LOW pressure switch is explained to dealers attending a service school sponsored by the Airtemp division of Chrysler Corp.

▸ THE TRAINING DEPARTMENT of the Airtemp division, Chrysler Corp., uses an electrically operated panel board to explain the operation of the controls, relays, capacitors, transformer, contactor, motor overload and other electrical components of a standard year 'round heating and cooling system. The panel enables the instructor to simulate actual control performance.

▸ TRION, INC. will supply the electronic air cleaners for New York's new Socony-Vacuum building.

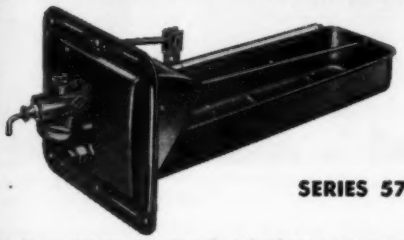
▸ TO REMIND HEATING DEALERS to take along a replacement set of furnace humidifier evaporator plates when going out on late summer service calls, Viking Air Conditioning division, National-U.S. Radiator Corp., is packing replacement sets of five plates in bright orange and black cartons designed to be easily recognized on distributors' shelves. Each carton is imprinted with a reminder to "change plates each heating season."

COMPLETELY ASSEMBLED

Vaporite

AUTOMATIC HUMIDIFIER

OFFERS QUICKEST – FASTEST INSTALLATION
ADJUSTABLE TO SLOPING OR STRAIGHT
BONNET FURNACES



SERIES 577

Stainless steel construction. Drip-feed puts just enough water in pan for fastest vaporization. Eliminates scum . . . no stagnant water pan.

Pre-assembly cuts labor time and costs. To install simply cut hole in plenum wall, slip VAPORITE in just as it comes from shipping package.

Get complete information. Write. A-8.

Automatic Humidifier Co.
CEDAR FALLS, IOWA

Cut Installation Costs!
One hammer blow permanently rivets

E-Z-ON

E-Z-ON Damper Controls are easily, quickly installed to save you time and money. E-Z-ONS lower initial cost offers you additional savings and extra profits. Start saving money now. . . . Call your jobber today!

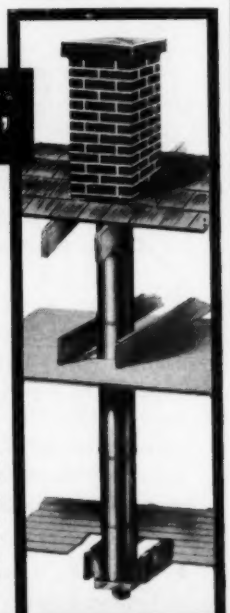
LEADING JOBBERS STOCK "EZ-ONS"

In Canada — THERMIDAIRE CORP. LTD. Toronto

M. A. GERETT CORP.

724 WEST WINNEBAGO STREET, MILWAUKEE 5, WISCONSIN

Now!
NEW AIR-JET "BRICK BEAUTY"



Why bother to build a chimney? Now you can enjoy all the time and money-saving advantages of an Air-Jet packaged unit . . . and, at the same time, increase the value of your homes with a chimney that looks just like brick!

The new "Brick Beauty" is made of embossed aluminum, finished in brick red color with depressed off-white mortar lines. Weighs less than 100 lbs.! Can be installed in one man-hour! And look at these quality features.

Shockproof, high temperature porcelain steel smoke pipe. Special draft top guards against downdrafts. Exclusive rain groove eliminates all leakage. UL approved for use with all fuels. You can take your choice of 2 models in 3 different smoke pipe sizes.

WRITE TODAY
for complete information!
A few distributorships available.

GENERAL PRODUCTS
COMPANY, INCORPORATED
DEPT. B-8
FREDERICKSBURG, VIRGINIA

• A PACKAGED CHIMNEY WITH AUTHENTIC BRICK LOOK

THIS AUTO LAUNDRY HAD TO CLOSE IN COLD WEATHER . . . *until a Delta* OIL UNIT HEATER *was installed!*

PROBLEM: In winter, with both doors open, wash water froze on cars and this auto laundry had to close down.

SOLUTION: A Delta oil-fired unit heater was installed near the entrance. It suited this installation perfectly because it requires no large chimney, boilers or pipes, it suspends out of the way and operates on low cost #2 oil.

RESULTS: When the outside temperature is 0°, temperature through the long building is now 50° — with both doors open. The Delta Unit Heater extended business hours and increased profit considerably.

Send for complete new catalog

This is only one of hundreds of jobs that a Delta OIL Unit Heater can do better and more economically.

DELTA HEATING CORPORATION

TRENTON 8, NEW JERSEY

New!
"Positive Lock"
PIPE HANGERS
for ROUND PIPES
Eliminate old fashioned methods of hanging pipe on heating and cooling installations ... cut costs and do a neater job. Hangers available in Six Lengths, from 2¾" to 11"
PATENT PENDING
NEW POSITIVE LOCK
IMPROVED SQUARE DUCT HANGER
NEW
With New "Positive Lock" cam action feature ... No Special Tools! Hammer does the Job! Available in six lengths.
Cam Action Assures "Positive Lock"
AS LOW AS 2½¢ EACH
• Sharp prong pierces
• Insert "Positive Lock"—tap in place
• Drive sharp prong into joist
SQUARE DUCT HANGER
No. 15
SEE your SUPPLIER or WRITE for FREE samples
TEST THEM YOURSELF ON THE JOB!
PIPE
DUCT
A. M. HEXDALL CO.
MORRIS, ILLINOIS
Manufacturers of Sheet Metal Specialties

YOUR BEST INVESTMENT

LEVER **WHITNEY** PUNCHES

PORTABLE HAND OPERATED PUNCHES AND SHEARS. A TOOL FOR EVERY PURPOSE. LEADERS SINCE 1907

Please Write Today for Literature

See Your Jobber

NO. 2 PUNCH

Capacity 5/16" hole through ¼" iron
Length 23". Wt. 14 lbs. Depth of throat 1-11/16".
Punches and dies 3/32" to ½" by 1/64"
Also available — our Channel Iron Punch for use on angle and Channel Iron

NO. 8-B PUNCH

Capacity ¼" hole through ⅜" iron
Length 18½". Wt. 7½ lbs. Depth of throat 2"
Punches and dies 1/16" to 7/16" by 1/64"

W. A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

appointments . . .

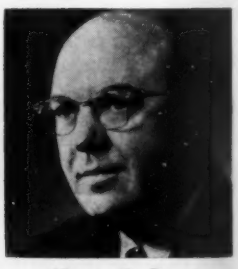
▸ CARL H. STRACK as marketing manager for the Toridheet division of Cleveland Steel Products Corp. Mr. Strack, formerly sales manager for C. L. Bryant Corp., will direct and supervise domestic distribution and sales of automatic heating equipment.

Carl H. Strack

Richard E. Sweitzer

▸ RICHARD E. SWEITZER as assistant sales manager in charge of residential sales for Trion, Inc. Mr. Sweitzer has been associated with the company for the past five years, formerly serving as advertising and sales promotion manager. He will handle residential sales through heating and air conditioning dealers in all principal cities.

Thomas E. Williams



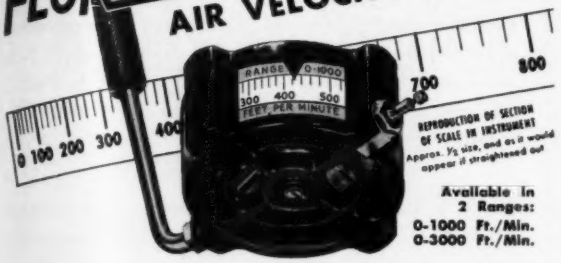
Homer R. Brown

▸ THOMAS E. WILLIAMS as general superintendent of the West Coast plants of Joseph T. Ryerson & Son, Inc. Mr. Williams will continue in his present capacity as superintendent of the Los Angeles steel service plant. Homer R. Brown has been named sales manager of the Milwaukee steel service plant. He has been with the company since 1930 and has served as representative in the Milwaukee area since that time.

▸ JAMES E. MASON as assistant advertising manager of Copeland Refrigeration Corp. Formerly Mr. Mason was with Grant Advertising, Inc.

▸ NELSON W. CAMPBELL as publicity manager for Servel, Inc. Mr. Campbell, formerly publication editor for General Motors' Electro-Motive division at La Grange, Ill., has also worked on daily newspapers as a sports writer, reporter and telegraph editor. The

FLORITE Direct-Reading AIR VELOCITY METER



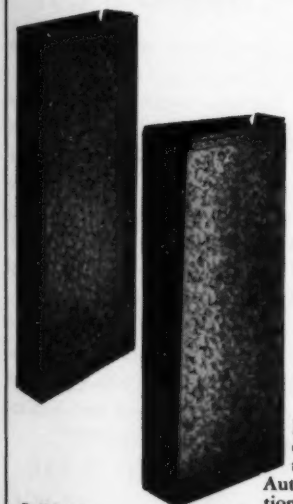
Available in 2 Ranges:
0-1000 Ft./Min.
0-3000 Ft./Min.

- *A practical, accurate air velocity meter for heating, air conditioning, and ventilating work. Indispensable for measuring grille velocities and air deliveries from registers and grilles; for balancing forced air heating systems, and for checking air distribution of all kinds of ventilating systems.*
- *Accurate velocity readings, automatically averaged over a 3" dia. free area, instantly indicated in feet per minute.*
- *Extension handle facilitates positioning of instrument away from the observer for readings in hard-to-reach locations, or where the observer's body would interfere with the normal air movement.*
- *Unique scale lock makes possible to retain scale reading when desired until the lock is released—an indispensable feature where extension rod is used to position instrument away from the observer.*
- *Leather case is furnished as standard equipment for added protection when the instrument is not in use and for convenience when carrying it in the pocket.*

Ask your Jobber for the FloRite or write for Leaflet 760.

BACHARACH INDUSTRIAL INSTRUMENT CO.
7301 PENN AVENUE—PITTSBURGH 8, PA.

ALL YOUR NEEDS In DUCTS and FITTINGS



AJAX

- **Highest Quality**
- **Precision Made**
- **Quick Assembly**
- **Forced Air or Gravity**
- **All Systems**

Fittings, Pipe and Duct are die cut and formed, fit up tight and fast with AJAX Automatic Snap Lock connections.

For extra profits, use AJAX Pipe and Fittings to save you installation time and labor.

WRITE TODAY
New complete line catalog complete with helpful data.
DIVISION of
THE CINCINNATI SHEET METAL & ROOFING COMPANY

AJAX FURNACE FITTING CO.
216-20 E. Front St.
Cincinnati 2, Ohio

STANDARD IN THE FIELD

Superior features of Tharco—

- **No Shrinking**
- **No Cracking**
- **No Checking**

THARCO is available in either black or light gray in 1-pound cans to 350 pound drums.

ORDER FROM YOUR JOBBER

THE ARMSTRONG COMPANY
241 S. Post Street • Detroit 17, Michigan

EST. 1911

This X-Ray View shows why *quickdraft* alone can claim . . .

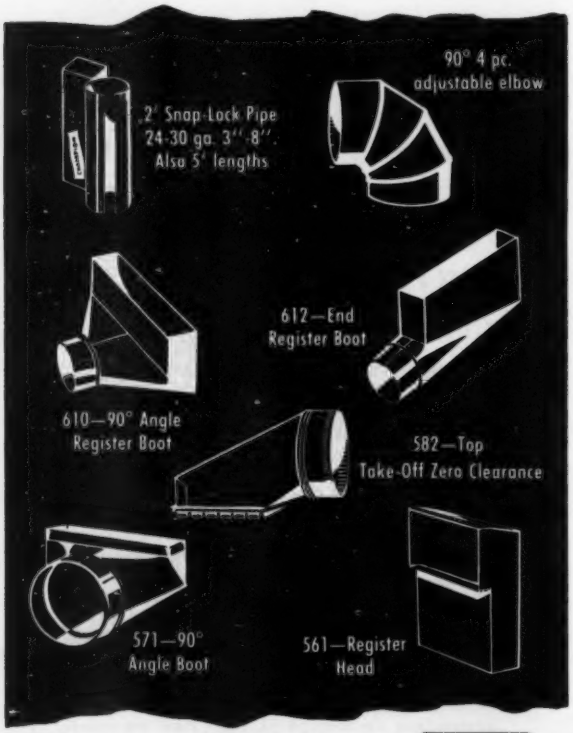
Patents are pending on the exclusive features of *quickdraft* which produce all the draft you need without obstructing smokepipe or flue. And we mean no obstruction—ever!

It's hard to believe, but true—the shorter the chimney, the better the draft with *quickdraft*. So, get all the facts. You'll want to use *quickdraft* on your next job. Write for complete literature, installation manual and name of nearest jobber, to Quickdraft Company, Dept. S, Dueber-Hampden Bldg., P.O. Box 87, Canton, O.

quickdraft
DRAFT CREATOR

CHAMPION
time-savers!

Less shop time and less job time puts more money in your profit column! That's why heating men order Champion pipe and fittings. Machine fabrication in the modern Champion plant gives you precision fit that cuts hours from the job – makes more money for you! Completely cartoned for economical shipping, easy handling, compact storage.


90° 4 pc. adjustable elbow
2' Snap-Lock Pipe 24-30 ga. 3"-8". Also 5' lengths
612—End Register Boot
610—90° Angle Register Boot
582—Top Take-Off Zero Clearance
571—90° Angle Boot
561—Register Head

There are many more profit-makers in the complete CHAMPION line! Order Champion for your next job!

AIR DISTRIBUTION INSTITUTE ADI STANDARDIZED FITTINGS MEMBER

CHAMPION

CHAMPION FURNACE PIPE COMPANY
211 Eaton Street Peoria, Illinois

appointments (Continued)

Isotherm Co., Bakersfield, Calif. has been appointed air conditioning distributor for Kern County. New distributor of air conditioning equipment in the Peoria Ill. area is Montefusco Heating and Sheet Metal Co., Peoria.

▶ A. T. GORDON as New York district sales manager for Delta Heating Corp. Mr. Gordon will headquarter in New York with offices at 152 W. 42nd St.

Donald G. Wright

Phillip J. White

▶ DONALD G. WRIGHT as general sales manager of the appliance and furnace sales divisions of Perfection Industries, Inc. Mr. Wright assumes the duties of J. H. Rasmussen, who has retired as vice president and director of appliance sales. Phillip J. White has been named sales manager of the company's refrigeration contract division. For the past three years he has been sales manager of the refrigeration products division of the Hupp Corp., whose central air conditioning business has been purchased by Perfection.

▶ STEPHEN M. RAMSEY as branch manager of Minneapolis-Honeywell Regulator Co.'s sales and service office in Miami. Mr. Ramsey, formerly manager of the firm's Columbus, O. branch, is being succeeded in that post by Robert R. Moore. Three regional managers have been appointed by the Home Products division. They are: Carl von Buelow, in charge of the southwestern and Rocky mountain region with headquarters in Dallas; Edwin A. Spellerberg, the central and southeastern areas with headquarters in Columbus, O; and David Plesser in charge of the east and mid-Atlantic coast regions with headquarters in New York City. The new managers will be responsible for the sale of automatic control equipment and systems to the home builder market.

▶ AIROFLO ENGINEERING CO., 3777 Cahuenga Blvd., North Hollywood, Calif. as manufacturer's representative for Mammoth Furnace Co. in southern California and the state of Arizona. Other newly appointed representatives are H. O. McDowell Co., 738 E. Henry Clay, Milwaukee, who will cover part of Wisconsin;

Complete Line of

BRUSHES SCRAPERS

For Cleaning

TUBES and FLUES

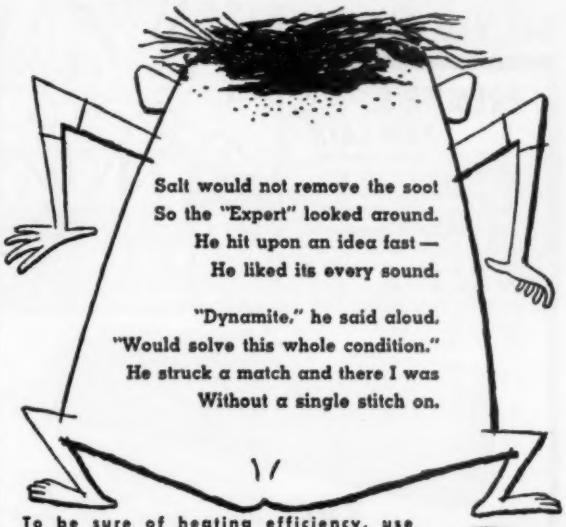
of

- BOILERS
- FURNACES
- CHIMNEYS

Write Today
For Free Catalog

WORCESTER BRUSH AND SCRAPER CO.
Division of
MASON-WORCESTER BRUSH CO.
38 AUSTIN ST. WORCESTER 1, MASS.

the Good Old Days?
and there I was . . .



Salt would not remove the soot
So the "Expert" looked around.
He hit upon an idea fast —
He liked its every sound.

"Dynamite," he said aloud.
"Would solve this whole condition."
He struck a match and there I was
Without a single stitch on.

To be sure of heating efficiency, use
"CLEAN RIGHT" SOOT REMOVER
NON-CORROSIVE NON-EXPLOSIVE
LEAVES NO RESIDUE
Always look for the broom on the package.

MILLER PRODUCT CO.
3046 CEDAR ROAD • LANSING MICHIGAN

NO PINCH!
It's a Cinch!

WHEN
Galvan Elbows
are installed

"THEY FIT
LIKE A GLOVE"

GALVAN
Manufacturing Co.
New Albany Indiana

Ask Your
Jobber

THE RIGHT SHEAR
FOR ANY CUTTING JOB

MARSHALLTOWN

ROTARY
THROATLESS
SHEARS

CUTS ALL SHAPES—SIZES
- QUICKER
- EASIER
- FASTER

Here's a shear that's right for every job. Speedy — efficient. Cuts up to ¼ inch stock — speed to 6 ft. per minute. Excellent for irregular cutting or straight splitting. Available in hand operated or motorized models. Prompt shipment. Send today for special illustrated bulletin.

MARSHALLTOWN
MANUFACTURING COMPANY
Marshalltown, Iowa

BASEBOARD DIFFUSERS
Got You Down?

PREMIER'S FAN-AIR

will set you up for profitable sales! Scientifically designed to fill the need for an efficient, practical, easily installed, sensibly priced baseboard diffuser for use with small pipe systems. Damper control. Carefully formed. Attractively finished.

FREE *Write for folder on FAN-AIR Diffusers and 32-page Engineering Guide. Ask about complete FAN-AIR System; CF and PZ Oil and Gas Units.*

PREMIER FURNACE COMPANY
Manufacturers of Warm Air Heating and Air Conditioning Equipment
Dowagiac, Michigan

appointments *(Continued)*

L. E. Gosling Co., 410 S. E. Division Pl., Portland, Ore., whose territory will comprise Oregon, Washington, part of Idaho and the province of British Columbia; George R. Mellema Co., 620 Plymouth Bldg., Minneapolis, who will handle sales in North and South Dakota, Minnesota and parts of Wisconsin and Michigan; Ayton and Ashton, with offices at 2809 Jefferson Davis Highway, Arlington, Va. and 3226 Pinehurst Pl., Charlotte, N. C., who will cover Virginia, the District of Columbia and the Carolinas; and Heatco Equipment Co., 12 N. Third St., Rowlands Bldg., Columbus, O., who will handle sales in central Ohio.

▸ The Wadel-Connally Hardware Co., Tyler, Tex., as distributor of oil and gas heating equipment and other products for Perfection Industries, Inc. in 29 Texas counties.

▸ The Mills and Lupton Supply Co., Chattanooga as distributor of ventilating sets and industrial fans for Westinghouse Electric Corp.'s Sturtevant division. Territory to be served comprises an area within a 100 mile radius of Chattanooga. Gierke-Robinson Co., Davenport, Ia. has been named a distributor of venti-

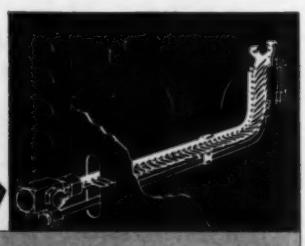
The MODERN Lighter Tube
With the Slanting Blue Flame

Today's Great Contribution to Gas Appliance Safety and Dependability!

To safeguard all users of gas-fired heating equipment and appliances against hazardous lighting methods, more and more manufacturers are engineering the MODERN Lighter Tube into their units. Utilities and wholesalers too, strongly favor the MODERN Lighter Tube as a component part of all gas-fired units. Dealers recognize it as a vital sales feature. Available in aluminum or stainless steel ⅜ O.D. tubing.

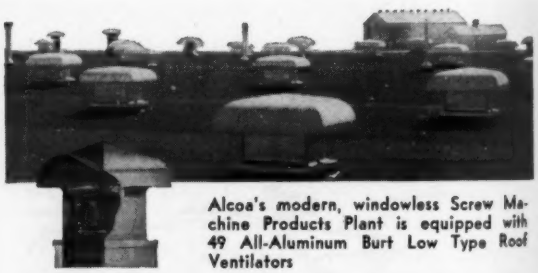
The MODERN Lighter Tube offers the utmost in . . . .

★ SAFETY
★ DEPENDABILITY
★ SIMPLICITY
★ CONVENIENCE



MM CO. PERFECTED OUTSIDE LIGHTING

MODERN MATERIALS CO.
NORTHVILLE MICHIGAN



Alcoa's modern, windowless Screw Machine Products Plant is equipped with 49 All-Aluminum Burt Low Type Roof Ventilators

Aluminum Co. of America Licks Ventilation and Oil Mist Problem with Burt Ventilators

The 200,000 square feet of floor space in this modern building has no cross circulation or natural ventilation. Production operations create considerable heat and oil mist. All-Aluminum 48" Burt Low Type Roof Ventilators are used to maintain a pleasant working atmosphere the year around. Oil mist is scarcely discernible. 25 ventilators supply air — 24 exhaust. According to the Alcoa Staff Engineer for Air Conditioning, the initial cost of air supplied by the Burt Ventilators is less than one-fourth that of a centralized duct system.

Send for FREE Data Book! Write for Burt Data Book SPV-101-E on Burt's complete line.

FAN & GRAVITY VENTILATORS • LOUVERS • SHEET METAL SPECIALTIES

Burt's 53 years of experience is available to solve your ventilating problems — without obligation.

The Burt Manufacturing Company
38 E. South St. Akron 11, Ohio

MEMBER POWER FAN MANUFACTURERS ASSOCIATION

Added Income, Bigger Profits, The Easy Super Red Streak Way

Clean all kinds of heating plants faster and easier with a Super Red Streak Model SH Furnace Cleaner. Helps sell repairs, new plants. Both wet and dry pick-up. Cleans chimneys from basement. Special non-clog filter bag for oil plants.

Ask your wholesaler. Write for free Super Sales Plan Book.

Super Red Streak Model SH—Approved by Underwriters' Laboratories and Canadian Standards.

NATIONAL SUPER SERVICE CO., INC.
1944 N. 13th St. Toledo 2, Ohio
Sales and Service in Principal Cities.
In Canada: Plant Maintenance Equipment Co.
Toronto, Montreal, Vancouver

SUPER SUCTION
SINCE 1911
"THE DRAFT HORSE OF POWER SUCTION CLEANERS"

SAMPLES FREE

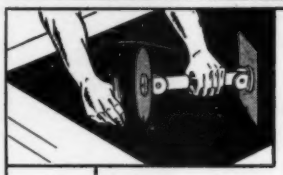
SODER STAINLESS STEEL RAPIDLY

FLUXES
SODERING
BRAZING & WELDING
L. B. ALLEN CO. INC. Chicago 31, Ill.

"WA-TROL"
THE IMPROVED AIR-FLOW REGULATOR

• The Wa-Trol damper control is simple to install; makes damper adjustment easy. Made of ivory colored Styrene, Wa-Trols do not fade, rust or peel; and they are impervious to temperature and humidity. No tools are required to make damper adjustment—just a push and turn hand motion; reduces installation balancing time as much as half. • Ask your wholesaler for Wa-Trols.

THERMAL AGENCY
National Sales Agents
THERMAL BLDG. • 1515 DALLAS • HOUSTON, TEXAS



Order this time saver today

JET PATTERN DEVELOPER

ONLY $69.50
COMPLETE WITH 39 TEMPLATES

LAYOUT ANY PATTERN COMPLETE IN MINUTES.

ATTACH TEMPLATES, ADJUST FOR PITCH OR OFFSET AND ROLL OUT PATTERN.

H. OWENS COMPANY
9300 Venice Blvd., Culver City, California

"CORRECT PRACTICE in OIL HEATING"

NOW AVAILABLE TO YOU!

A complete reprint of the valuable series

by J. J. Mirabile

This practical series covers every angle of oil burner work, including arrangement of shop . . . stocking of parts . . . record-keeping . . . installation procedures . . . the handling of crews . . . how to make heating surveys . . . how to size combustion chamber . . . how to install thermostat . . . how to start the burner . . . how to use testing instruments . . . and how to operate a service department. It contains, as well, a complete list of causes and cures of oil burner troubles that will serve as a reliable guide in making service calls.

Every shop handling oil burner jobs should own this book. Full size, 8½ by 11 inches — 57 pages of practical helps. Send $1.00 for a copy to the address below.

KEENEY PUBLISHING COMPANY

6 No. Michigan Avenue Chicago 2, Ill.

SELL THIS "PERFECT CAP"
for Chimneys — Flues — Ventilators

Draft King

"Draft King" eliminates Draft Troubles, acts as spark arrester, creates even stack temperature, improves combustion and cuts fuel costs. Field tested with all types of units everywhere. Will not freeze shut or soot up.

Improved features give long life. New cap adaptors are now available in galvanized steel or aluminum for all size flues, ventilators and chimney stacks. Caps may now be installed in a matter of minutes. Contact your favorite distributor, or write:

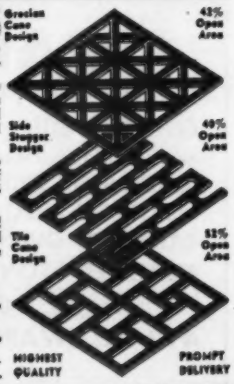
A. R. WOOD MF'G. CO. Dept. A-85 **Luverne, Minn.**

PERFORMATED METALS FOR EVERY INDUSTRIAL USE

The "Ornamental" light-gauge designs here illustrated are only a few of the many you can choose from in our new Catalog 39 and we are always pleased to quote on original designs or special work of any kind.

For larger unit-openings, using metals up to ¼" in thickness, we offer a wide variety of equally attractive designs in our Catalog 36 on Diamond Architectural Grilles.

Send us your blueprints. We are equipped to fabricate special sections to any desired extent and welcome opportunities to make money-saving suggestions.



DIAMOND MANUFACTURING CO.
Box 34 WYOMING PENNA.
(Wilkes-Barre Area)

Sales Representatives in all principal cities. Consult Your Classified Telephone Directory.

HIGHEST QUALITY PROMPT DELIVERY

Hammel MA Since 1907 Comfortaire H.C.70

ONE OF A NEW LINE OF FORCED AIR FURNACES
Designed for Small Homes

The new Hammel "Comfortaire" line of forced air furances, models H.C. 70, 105, 140 and 175 in capacities from 70,000 to 175,000 BTU input makes possible a variety of choices to fit a particular job. For example, "Comfortaire" H.C. 70 model illustrated—14" wide by 25½" deep, allows installation at reduced clearance in closet or alcove—ideal for small homes.

"Comfortaire" H.C. models produce abundant warmth, operate efficiently and are amazingly quiet. Draft diverter built into element allows extra heating surface. All are built to precise specifications and attractively finished in Hammel blue baked enamel. All A.G.A. approved and carry Hammel 10 year guarantee.

Hammel
RADIATOR ENGINEERING CO.
Owned and Operated by A. S. Martinson and Associates
3368 Motor Ave. Los Angeles 34,

PRICED FOR TODAY'S MARKET

WRITE FOR CATALOG

appointments (Continued)

lating sets, industrial fans and gas fired unit heaters by the division. Gierke-Robinson has branch offices in Des Moines and Waterloo.

▶ STARNES & GLASS, Cincinnati as representatives for Ohio and adjacent Pennsylvania territory for the Connor Engineering Corp. Walter B. Stamberger, Jr., Rutherford, N. J. has been named representative for northern New Jersey.

Obituary

H. Carl Wolf

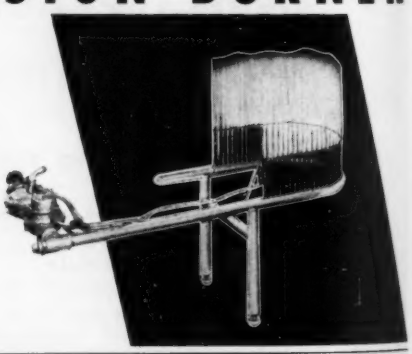
H. CARL WOLF, for many years managing director of the American Gas Association, died June 26 at the White Plains (N. Y.) hospital. He was 63 years old. During his years with the association Mr. Wolf played a prominent part in its program of promotion, advertising and research. Ill health caused him to take leave of absence from his duties as managing director about a year ago; however, he was retained as a consultant to the association. He is survived by his widow and one son.

SUPER-JET GAS CONVERSION BURNER
. . . is the answer!

Super-Jet's advanced engineering has developed a silent, automatic, *multi-jet* type conversion unit for complete heating comfort.

This burner generates own current for completely automatic and safe operation, not dependent on any outside source for current. Designed for natural gas — certified by AGA — with a consumer guarantee.

Some territories still open for manufacturers' representatives calling on wholesalers.



WRITE TODAY TO
DOWNING STEEL PRODUCTS CO. 4005 SMITHVILLE ROAD DAYTON 9, OHIO

REPAIR PARTS
for STOVES, FURNACES and BOILERS
GAS • OIL • COAL • ELECTRIC
TRY US FOR THOSE HARD TO GET ITEMS
JOBBERS OF FIREPLACE FIXTURES • FIREPLACE CIRCULATORS • INCINERATORS • BARBECUE OVENS AND GRATES & DOORS
METZNER STOVE and FURNACE SUPPLY COMPANY
413 DELAWARE ST. K.C. 5, MO.
Est. 1880

ORNAMENTS
STAMPINGS & SPINNINGS
Zinc Ornaments Available From Stock. Copper, brass, bronze, aluminum and stainless steel ornaments made up promptly.
If you don't have catalog K, send for it NOW.
MILLER & DOING
89 ADAMS STREET BROOKLYN, N. Y.

CLASSIFIED ADVERTISING

situations open . . .

Exceptional opportunity for a sales-minded engineer (26 to 40) with oil burner experience. To assist Sales Manager in contacting major oil burner manufacturers and service organizations nationally from Home Office at Des Moines. Duties include sales engineering, service and extensive field sales promotion work. Salary and travel expenses with excellent chance for advancement in growing company. Your reply kept confidential. Write or call Director of Sales, Delavan Manufacturing Company, Grand Avenue and 4th, West Des Moines, Iowa. Phone 7-4471.

PROJECT ENGINEER — A large, well known manufacturer of heating and air conditioning equipment who is expanding its engineering staff and facilities, has an opening for a man qualified to assume design responsibility on gas and oil-fired residential heating equipment. Located near Chicago. In responding, include a resume of experience, background and salary requirements. Our organization knows of this advertisement; all replies will be held in strictest confidence. In replying, please write to Key 1000, American Artisan, 6 North Michigan Avenue, Chicago 2, Illinois.

SALES ENGINEER — Leading Manufacturer of year 'round air conditioning equipment with national distribution has opening for sales engineer well versed in all phases of heating and summer cooling. Must have experience in residential, commercial and industrial application, both forced air and boiler systems. Age preferably between 20 and 45 years. Must be willing to travel and relocate if necessary. When applying, give full resume of experience and qualifications, salary, commensurate with responsibilities. Our organization knows of this advertisement, your reply will be held in strictest confidence. Write Key 999, American Artisan, 6 N. Michigan Ave., Chicago 2, Illinois.

WANTED — Chief Engineer — Wonderful opportunity for advancement with fast-growing, aggressive manufacturer of fans and blowers. Will be in complete charge of design and development. Excellent opportunity for creative engineer. Plant located in progressive, modern, Midwest community. Staff knows of this ad. State experience and qualifications first letter. Reply to Key 990, American Artisan, 6 North Michigan Avenue, Chicago 2, Ill.

HELP WANTED — Experienced man or beginner in take-off quantities on ductwork and ventilating systems, New York area. Reply giving experience and starting salary desired. Address Key 992, American Artisan, 6 North Michigan Avenue, Chicago 2, Ill.

agents wanted . . .

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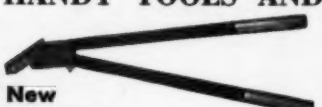

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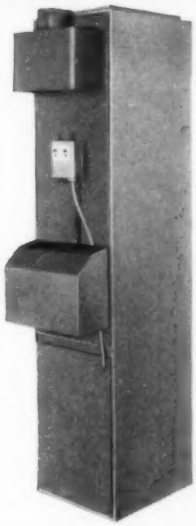

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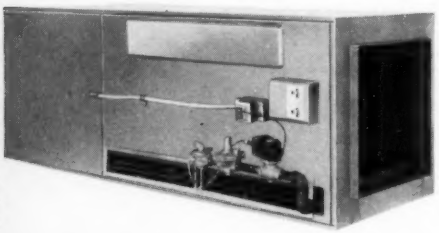

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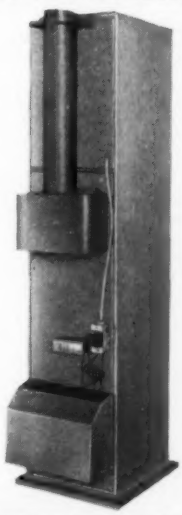

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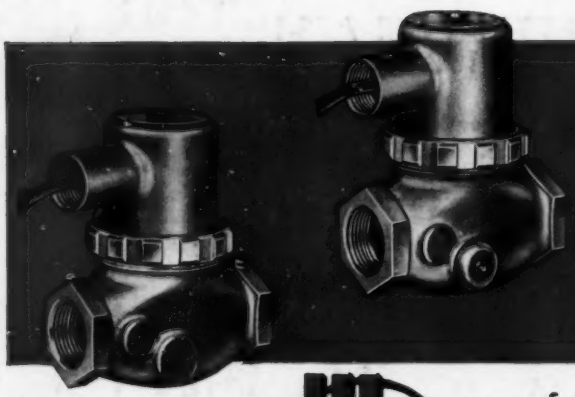

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